Telephony.

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An Eloquent Endorsement of Independent Securities.

"Daniel H. Somers, liquidating the Columbus Savings & Trust Co.," says a Columbus, Ohio, dispatch, "has just completed an investigation of the telephone securities held by that company and reports that they will be realized upon. These are the securities," the item continues, "of Independent plants at Austin and San Antonio, Texas. They represent several hundred thousand dollars of the company's investments and, in the opinion of Mr. Somers, will bring a full return to the depositors. The Columbus Savings & Trust Co. held control of the San Antonio plant and little short of a majority of the stock of the Austin plant. These securities will be sold, Mr. Somers said, as soon as such a sale can be made with advantage to the depositors of the bank. The sale of these securities will practically assure the payment of the depositors in full."

Here is a trust company which placed a large part of its reliance on Independent telephone securities and which will "pay the depositors in full" because those telephone investments were sound.

So entirely disinterested and unsolicited and yet so eloquent an endorsement of Independent securities it were hard to find.

That Independent stocks and bonds are almost uniformly of a nature to commend them to conservative investors is not in the least novel. A near-dramatic situation such as this at Columbus serves merely to emphasize that fact.

The Transmitter Mouthpiece and Tuberculosis.

At various times there has been considerable agitation in regard to the mouthpieces used on public telephone instruments. As the lips of the telephone user are in close proximity to the mouthpiece, it was claimed that there was great danger of disease being transmitted by it.

Recently in the house of commons, England, inquiry was made as to whether any investigation had been made by the postmaster general in regard to the dangers which it was claimed arose from the use of telephones by persons suffering from tuberculosis. It was then announced that a prolonged investigation of the subject had just been completed by Dr. Harold Spitta, an authority on bacteriology. It included not only the mouthpiece used in public places but also mouthpieces of instruments installed at a sanitarium for the regular and exclusive use of tuberculosis patients. Dr. Spitta reported that in his opinion "The transmission of tuberculosis through the medium of the telephone mouthpiece is practically impossible."

In making the investigation the mouthpieces and the discs at their bases were first carefully washed in a small amount of distilled water. The water was then injected under the skin of a number of healthy guinea pigs.

A large number of experiments extending over many months was made, but in no instance did a guinea pig develop any signs of tuberculosis. Referring to the use of living animals for the tests, a London physician stated: "There is no other test anything like as certain or accurate as this."

The results of this investigation will undoubtedly aid in removing from the public mind, the sense of danger in the use of public telephones. It is nevertheless highly important that the mouthpieces of instruments installed in public places should be kept clean.

A mouthpiece of the kind in common use if not cleaned regularly, soon becomes an uninviting object. The accumulation of dust particles combine with the moisture condensed from the breath of the telephone user and form a more or less disagreeable looking coating on the inner surface of the mouthpiece.

A Significant Access of Building.

Within the space of one week TELEPHONY was advised of the projected building of six modern Independent telephone exchanges in as many different parts of the country. In every case funds were in hand and plans completed for the work, and nearly every plan involved the buying of new and more modern equipment.

This in no way reflects hard times, an unsteady market

for securities, or an uncertain outlook for new business. There is a certain air of solidity in the very thought of six new exchange buildings in one week that is satisfying. And these are not part of complete, new systems, such as Chicago, or Dallas, or Quebec. They are betterments being undertaken by old, established companies.

Something New for Managers.

A news item from Burlington, Kans., says that "the Burlington Telephone Co., C. B. Ford, manager, has inaugurated something new by establishing a free employment bureau in connection with the central office so that farmers and others in need of help can secure it and men out of employment can find work. The trouble is that there is not enough help to go around and there are a number of positions open with no men available."

Here is a suggestion for the further advertisement and popularizing of Independent telephone service. Such a registration bureau as is here indicated would make but small demand upon an operating force already accustomed to supplying information of all kinds to an eager and (in the main,) appreciative public.

The Human Element Behind the Telephone.

Again the telephone has revealed itself as a saver of human life, this time on a large scale. In the disastrous floods which have swept and are, at this writing, still sweeping portions of the South, the loss of life has been immeasurably minimized by the telephone, which today reaches every community and, indirectly, at least, every individual, even in the rural districts.

Advice from Marked Tree, Ark., printed elsewhere in this issue, illustrates its operations generally in the flooded district. Emphasizing this, the Dallas News says:

> Despite the fact that Mississippi river floods have devastated a vast expanse of country in eastern Arkansas and left thousands homeless, the loss of life occasioned by the breaking of the levees and the overflow of the rich farming country that lies under the banks has been inconsiderable. Warnings have gone forth in time and every man within sound of the bell of his country telephone has had an opportunity to load his household goods upon a boat and float away when the waters came.
>
> The facility that has been extended to serve that section of the country liable to floods has saved thousands of lives. In former years, after the crest of some tremendous wave on the Father of Waters has passed, the human toll has been found to be great. The slender wires that have been woven over the country have wrought a wonderful change.

Another dispatch, along this same line, in the Baltimore Sun says:

> Edmunson, Ark., is deserted. The only remaining inhabitant is a telephone operator, who moved his exchange to a railroad box car located on a high point on the track. Today he reports water rising rapidly. It is on the floor of his car.

Supplementing this, in a lengthy item from the flooded region the Little Rock (Ark.) Gazette adds:

> One of the most noticeable features of the floods in eastern Arkansas has been the manner in which telephone communication with all points in the overflowed district has been maintained. There have been few interruptions in the service between Little Rock and all parts of the flood district, and these interruptions have been of short duration. Towns which have been inundated and cut off from railroad transportation have still been in communication with the outside world through the telephone and have been able to summon aid without which many people would have suffered.
>
> It is declared that the telephone has aided in saving many persons from being overtaken by the flood waters and has enabled many residents of the submerged section to save their property. At the first intimation of danger, the telephone operators have sent the warning out over the wires and residents of the lowlands have been able to prepare for the flood.

As indicating how faithfully and reliably the telephone, and the men and women behind it, have performed their work under the most exacting conditons, the Charleston (Mo.) Courier says:

> Great praise is justly due the telephone operators in Charleston and vicinity for the splendid work they have been doing since the flood became a menace.
>
> These girls worked most of the night Saturday sending out warnings to people in the affected district that the levees were not expected to hold, and notifying people to get to high ground. Had it not been for their work, there might have been loss of life as well as the loss of property.

And so the telephone continues to perform its increasingly important work in the world of real life. Whether in joy or in sadness; whether criminals are to be tracked, a baseball score reported, or human lives saved, the telephone and the human element which vitalizes it are to be found doing the work.

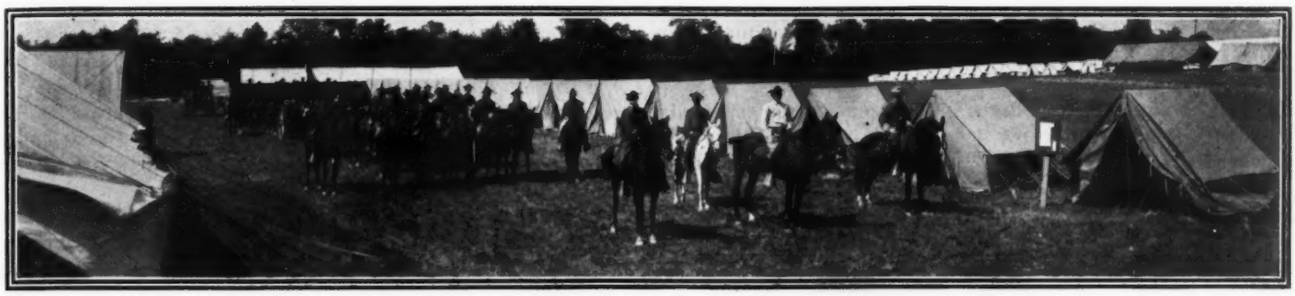
We acclaim the heroism of the wireless telegraph operator in moments of stress like those when the Titanic sank. Let us reserve a few encomiums for the humble, and often nameless, heroes and heroines of the telephone who meet the great occasions in their lives without the stimulating spot light of publicity and far from the possibility of ever achieving a niche in the newspapers' evanescent hall of fame.

Why Not Be Optimistic?

Myron T. Herrick, the new ambassador to France, sailed recently, and before going expressed himself in no uncertain terms as to his certainty of better business.

"I am an optimist in business," said he, "and I believe the outlook for an increase in business in the United States is splendid. I have sufficient confidence in this country to right itself, after a period of business depression, to look forward with the greatest enthusiasm to a great business revival. The iron and steel outlook in Ohio is excellent and the majority of the plants are running nearly to capacity. I look forward to a greater volume of shipping on the Great Lakes than there was in 1911, which was a very good year."

With everything pointing towards a solid and substantial upturn, with the telephone business particularly giving the liveliest indications of a big advance this year, we ought to find it easier to be optimistic than the reverse. Besides it's a lot more pleasant and it helps business.



Galloping Telephony

By L. W. Griswold

DOWN on the Mexican border, not so very long ago, the United States army engaged in a series of maneuvers the like of which in certain respects has not been equalled in this land since the Rebellion. For one thing, there was a whole regiment of artillery, more big guns for field use than have been gathered together in forty-six years. The gathering shelled a good-sized mountain and slit it into strips.

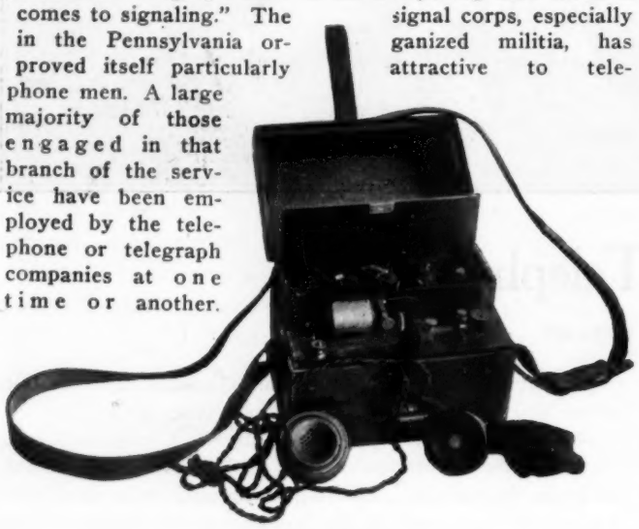
Many of the activities connected with the maneuvers provided the severest test to which the men and equipment have yet been subjected. For example, during the sham invasion the army covered a great many miles of that Texas mud whose stickiness knows no equal. Throughout the tiresome marches the various commanding officers were always connected with the camp base and various tactical units by telephone and telegraph lines, although the latter were many miles from the mobile army. This was due to the signal corps which steadily unreeled and operated telephone and telegraph lines while the troops trudged on.

These telephone-telegraph lines stretched from each commanding officer's station in little fan-rib patterns that covered the battlefield. The wires running here and there might well be likened to the human nervous system. Consider the army commander as the brain; he sends commands similar to the brain impulses of the body. The commands are carried over the telephone-telegraph lines to the various corps and on down from officer to officer until the artillery, engineers or cavalry undertake the execution of the general's orders. The artillery might be compared to the human muscles acting on the nervous stimulus received from the brain, and the comparison can be carried still further by calling the cavalry the eyes and ears of the army, and the infantry the backbone.

In order to overcome the many obstacles in transmission of messages and orders in the field, various methods are employed and the telephone and telegraph are augmented

A "Corking" Story—Camp of Co. "A," Signal Corps, Pennsylvania Organized Militia.

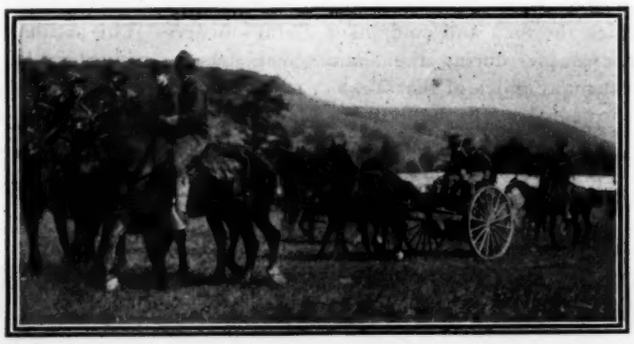
by the heliograph, wireless and wig-wagging. But as an officer in the signal corps said the other day, "The telephone and telegraph have it on everything else when it comes to signaling." The signal corps, especially in the Pennsylvania organized militia, has proved itself particularly attractive to telephone men. A large majority of those engaged in that branch of the service have been employed by the telephone or telegraph companies at one time or another.



The Field Buzzer.

"Linemen and telegraphers make the best signalmen." This quotation and the one in the preceding paragraph are quoted from statements of Captain Fred G. Miller, Signal Corps, Pennsylvania National Guard.

Let us suppose for an instant that you are accompanying a driver of an air craft that hovers over an advancing United States army invading hostile territory. From the army's headquarters, twenty miles back into your horizon, the troops have been plunging forward since before daybreak. Several corps, divisions and brigades pass beneath you, and since you are on the watch with a powerful glass, perhaps you can make out little detachments with two-wheeled carts and men carrying lances. Hover closer to the earth and with a slightly finer twist of your glass, perhaps you can make out a black streak that wriggles in the dust from the two-wheeled cart. The lancemen are on horses and stabbing at the black streak as the cart bumps and sways behind the galloping horses. The black streak is a diminutive telephone cable and the men with lances are linemen poking it to the roadside, into underbrush and behind rocks, where it will be out of the track of the tramping troops.



Signal Corps Taking the Field.

One of the riders attached to this squad starts up a roadside hill. He comes directly toward you and you can see that his thigh carries a black and nickel attachment. He is bareheaded and one ear is covered by a patch. He is an army operator going to the hilltop to stretch himself in an effort to see the road-forks that you can easily make out from your air craft. As his mount struggles up the hill, the rider is talking from the saddle to an officer ten miles away. A 33-gauge copper wire, around which is twisted two piano strands, reaches to the cable just laid from the two-wheeled cart. The rider's circuit is grounded through his horse, and his little telephone and telegraph set that weighs less than five pounds—including batteries—"talks" as well as the ordinary commercial set.

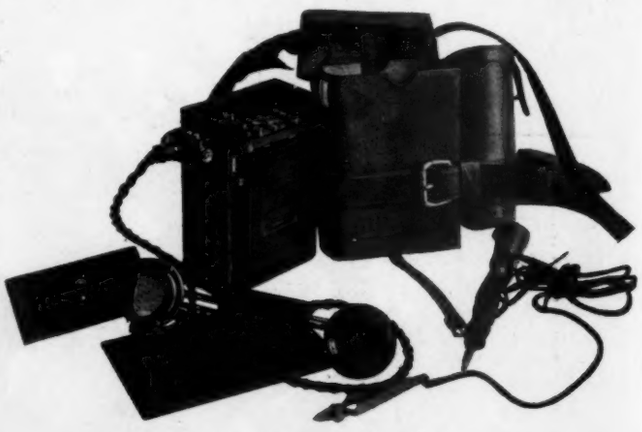
If yours is a real air craft it should come to grief at about this point. Perhaps the army has been halted for a rest. Anyway, it will be worth your while to pull yourself together and examine the signal corps and its apparatus while your feet are on the ground. Let one of the signal corps officers take you under his wing and explain some of the telephone details connected with his command.

You will learn that a field company of the signal corps is lined up in this position. First come four riders abreast. They are the "lineman," "operator," "horseholder" and "messenger." The lineman looks after the proper paying out of the wire; the operator is responsible for the transmission of all telephone and telegraph messages; the horseholder does as his name implies when the riders are busy on foot; and it is the messenger's job to receive and dispatch all messages.

Strapped to the operator's thigh is a complete telephone and telegraph set. The whole apparatus, which is called a "cavalry buzzer," is not much larger than an ordinary case containing field glasses. This type of instrument first proved its wartime capabilities in the Philippine and China campaigns. The telegraph works over circuits impossible to the ordinary Morse set. The buzzer will buzz over bare wire laid on the ground, through barbed wire fences and across railroad rails. Instances have been known where the wire has parted and the circuit continued in operation, although the broken ends were some feet apart! This telegraph instrument's stability is due to the high induced voltage developed at the electromagnet when the current is interrupted.

Considering the hastily constructed lines and the delicacy of the current involved, the "buzzer" is a most efficient telephone instrument. The receiver and transmitter are in one piece, like a lineman's test set.

There is always a reel cart to each wire section, and this two-wheeled conveyance is the heavy piece about which the work of signal corps centers. Jaunting and bumping arrangements of this kind pay out tiny cables that extend from



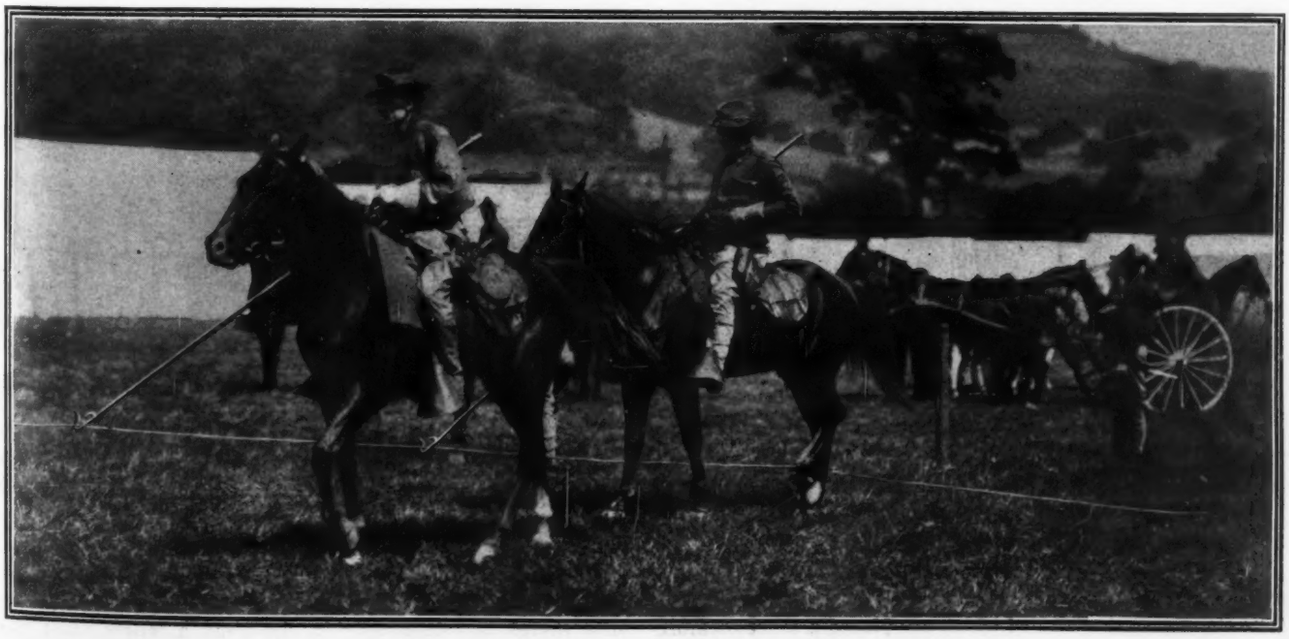
The Cavalry Buzzer.

each superior officer to the next man down the executive line, and so on until the active troops are virtually at the general's finger tips. This cable, half the diameter of a lead pencil, is the highway over which practically all battle orders travel these days. Hundreds of tests have shown

Field Reel Cart Paying Out Telephone Cable, Pikemen Following—A Bad Crossing.

Field Telephoning—Metal Pin Grounds Circuit.

Receiving Telegram, Using Rail as a Conductor.



Pikemen in Action, Manipulating Cable with Specially Designed Hooked Lances.

that one strand of copper surrounded by ten steel wires of pin-like diameter make a combination close to the indestructible. The cable has a tensile strength of about 300 pounds. A mile of it weighs seventy pounds and one charge

Barbed Wire Circuit Grounded Through Horse.

of the reel cart will cover ten miles. Cable of this sort has a peculiar property in that it lies flat on the ground. In fact, it will sink into ruts in such a manner that heavy wagons and the tramp of horses will not interfere with its powers of transmission.

Whenever the line is cut, as is the case in crossing railroad tracks, a hurry-up army splice is made. The cable is cut and shoved beneath the rails. Then a hard knot is tied, leaving about a foot of each end free. Next the insulation is skinned from the ends for several inches and the bare wires are twisted together.

Included in the driver's equipment is a head set something after the type of those worn by operators in telephone exchanges. Although the driver may be bouncing over a plowed field, he can talk over the telephone as long as the cart-wheels remain on the earth. You see, this particular telephone cable is grounded through the wheels.

Mounted men who follow the reel carts carry pikes. On the ends of these pikes are double hooks much the same shape and size of your left forefinger and thumb when you crook them to make a "C." The pikemen become very deft at throwing wire with these lances. The skill displayed in weaving the cable behind rocks, through fences, into trees and over buildings, is equal to the best efforts of a bare-handed civilian. The time taken is but an instant.

Wig-Wagging.

Field Telephone.

Army Telegraph.

Heliograph.

After the cable has been unwound and placed in ambush the telephone sets are attached. This is done with ingenious clamps on the jaws of which are placed a score or more of prickers that look precisely like sewing machine needles. When the clamp is in use those needles simply penetrate the insulation. Contact is established without impairing the cable insulation. Thus ends the more detailed inspection of the signal corps apparatus.

It may be that the army will advance for miles and miles before anything decisive happens. Then again winter may intervene and necessitate a halt for three or four months. In such cases the cable on the ground is replaced by a pole line built at the rate of from ten to fifteen miles a day.

The army semi-permanent line is built in this manner: First two wagons (one behind the other) are sent over the pole line route. From the first wagon is unwound No. 14 galvanized iron wire weighing 100 pounds to the mile. From the second wagon poles are thrown at the rate of eighteen or twenty to the mile. These poles are of lancewood, sixteen feet in length, two inches thick, and weigh about seven pounds. A barman follows the second wagon and digs the holes by simply jabbing his bar into the ground and pulling and pushing on it. After the barman comes a squad of soldiers. These men screw three-pound rubber insulators to the lance poles, attach the wire, then raise the poles and

Some of the "Bunch" Off Duty.

line. Each fourth pole is guyed to tent-pegs; turns in the line's direction necessitate an extra guy.

In times of war the linemen would not be bothered by questions of right-of-way or pole attachment privileges. The army would make its march and the telephone-telegraph line would go with it. "Telephone linemen and telegraph operators make the best signalmen," said the signal corps operator, who has had a wide experience.

The lineman is usually familiar with all the questions that arise in line building and he is quick to catch on to new things in telephony. In the army a fellow must use

his own head, for there is no one to blame but himself. It is up to the man on the job to build, operate and maintain a whole telephone and telegraph outfit. He must be able to jump from the work of a messenger boy to that of a chief operator, and then maybe he will be called upon to splice a cable,—all without a moment's hesitation.

"In floods, fires, earthquakes or other catastrophes, the duties of the signal corps are second only to the activities of actual warfare," continued the army man. "Just suppose this great city were in the hands of a mob. It would be impossible to connect our tactical units by wire or to maintain service on these lines without troops to guard the lines from being destroyed. But the commercial telephone and telegraph companies have conduits. We could go to them and send our orders and messages to our various units, unknown to the law breakers. On the other hand, if all commercial lines had been destroyed, we might be able to help the companies in communication with the outside world, by our rapidly constructed field lines.

"So you see," he concluded, "the signal corps and the telephone and telegraph companies have quite a bit in common."

The foregoing article is republished, by permission, from The Telephone News, Philadelphia, Pa. The photographs show Company "A," Signal Corps, National Guard of Pennsylvania, in action. They are reproduced through courtesy of Fred G. Miller, Captain, Signal Corps, Commanding Company "A," Pittsburgh.

Dielectric Conductivity.

At a meeting of the Institution of Electrical Engineers in March, Prof. J. A. Fleming and G. B. Dyke read a valuable paper on the power factor and conductance of dielectrics under the conditions which apply in telephony. Electrical Engineering, in London, in a late issue presented an abstract of the paper which is an exceedingly long one. The abstract is as follows:

The value S/C where S denotes the dielectric conductance at telephonic frequency and C the capacity, is of considerable importance. Condensers were made up with various dielectrics, and tests were made by the method indicated in Fig. 1. C_2, C_3, and C_4 are air condensers of variable capacity, R_2 is inductionless, and C and S are the capacity and conductance to be measured. An alternating current of pure sine form was obtained at three different frequencies, with the aid of a "wave filter" of the authors' design, and on balance the values required are calculable from the equations $\frac{S}{Cp} = pC_2R_2$ and $\frac{C_3}{C_4}\frac{C}{C_2} = +R_2 S$. p is, of course, $2\pi n$, where n is the frequency.

It was found that the value obtained for dielectric resistance by the usual "direct deflection" method with continuous current bore no relation to all the result under these high-frequency alternating currents, with which alone one is concerned in telephone transmission problems. For instance, the dielectric resistance of guttapercha is given in the old text books as $3{\cdot}5\times10^8$ megohms per centimetre cube at 75° F, and for pure rubber 18×10^9 megohms, after one minute's electrification, but these numbers are nearly 100,000 times greater than the true alternating current resistivity at the standard telephone frequency of 800 periods per sec. In fact, it was found that all the dielectrics tested possessed an enormously higher dielectric conductivity under these high frequency currents than under unidirectional currents.

This conductivity could be expressed as a linear function of the frequency, viz., $\sigma=a+bn$. The part of the conductivity denoted by the coefficient a is possibly electrolytic in nature and is greatly increased by the presence of moisture, while the part proportional to the frequency is a consequence of an energy loss possibly analogous to hysteresis loss.

The dielectric constant for alternating electric force is in most cases rather smaller than for unidirectional electric force. It was found that S/Cp, an expression nearly identical with power factor, was independent of frequency and temperature in the case of mica and dry paper, but in most dielectrics it increased with rise of temperature, and decreased with rise of frequency.

Remarkably abnormal results with variations of temperature were obtained with vulcanized india rubber and guttapercha.

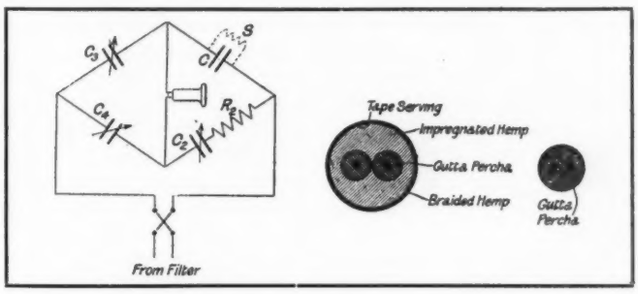


Fig. 1. Fig. 2. Fig. 3.

For instance, at 0° C, S/Cp for vulcanized rubber was 0·004 at 920 frequency; at 17° C it dropped to 0·002; and at 41° C. it had risen again to 0·006. For guttapercha the corresponding figures obtained at the same frequency were 0·024 at 0° C, 0·020 at 15° C, 0·014 at 19° C, 0·007 at 27° C, and 0·003 at 50° C. On the other hand, S/Cp for dry manilla paper was practically constant between temperatures from 0 to 60° C at about 0·007.

In the case of paper S was found to be approximately 0·000027 n, the coefficient a being zero. Tests of actual dry core cable bore out that S/Cp for paper was independent of frequency and temperature; it was only 0·003, that is to say, less than half that given by the test on the paper condensers, doubtless because of the air space.

Tests were made with guttapercha cable made up as in Figs. 2 and 3, and very large differences were noted, the former arrangement giving four times the power factor. At 920 frequency S/Cp for Fig. 2 was 0·106, and for Fig. 3, 0·029, the tests being made at 16-17° C. The tests indicated an S/C for the cable in Fig. 2 of 167 at 920 periods, or 145 when reduced to standard frequency of $p=5{,}000$.

In the tabulated results at the end of the paper, the ratio S/C for various materials at normal temperatures were given as follows:

Material.	S/C AT 920 P.P.S.	S/C AT 2760 P.P.S.
Dry Manilla paper tested at 19° C	41.6	125.0
Paraffin wax at 17° C.....	2·0	10·0
Mica at 16° C.....	7·0	21·0
Pure India rubber at 18° C..	30·0	80·0
Vulcanized rubber at 17° C..	12·0	40·0
Guttapercha at 15° C.....	117·0	389·0

The S/C for the paper cable tested was only 19·34 at 920 p.p.s., equivalent to 17·36 at the standard frequency of $p=5{,}000$. Having regard to the influence of S/C upon the attenuation constant, the authors regret that vulcanized rubber or paper cannot be used for submarine telephone and telegraph cables instead of guttapercha.

In considering these results, however, it must not be forgotten that S/C is not the only factor to be reckoned with in predetermining the telephonic properties of a cable. The capacity comes in again in the calculation of the attenuation constant, which is approximately $a=\frac{1}{2}\left(\frac{R}{L}+\frac{S}{C}\right)\sqrt{CL}$, where R is the conductor resistance, and L the inductance.

Ohio Company Would Sell Plant.

The Port William Telephone Co. has made application to the Ohio Public Service Commission for permission to sell its property to Clarence H. McKay, for $1,800.

Depreciation and Replacement of Growing Telephone Plants*

Causes Which Combine to Bring About Replacement of Plant—Discussion of Life of Plant—Provisions for Replacement—Methods of Estimating Amount to be Placed in Reserve Fund.

By Burke Smith

Physical plant begins to deteriorate, in general, immediately it is put in service, and in time requires replacement. In some cases physical plants have a certain salvage value or serviceableness after removal, either as junk in a disintegrated condition, or as serviceable plant to be used over again. When the salvage value is subtracted from the original cost in place, we have the wearing value.

Various causes combine to bring about the replacement of physical plant. Brief mention may be made of the following:

1. Normal wear and tear. In order to keep the plant in good working condition repairs, changes and replacements of small parts are necessary, and are usually included under the term "current maintenance."

2. Decrepitude or gradual deterioration, due to natural and usual causes.

3. Obsolescence or depreciation due to improvements or changes in the state of the art. Obsolescence may be due to invention or other demands which call for abandonment of plant which has not lived to the end of its usefulness. In the telephone field, obsolescence has been a very large factor in expenditures for replacements in the past, and continues to be a large factor at the present time, owing to the rapid development of new and revolutionary inventions and methods and lack of standardization.

4. Inadequacy, or inability to meet the increased demands of service in an economical or convenient manner. Inadequacy may be due to more rapid growth than could be foreseen. Public utility companies are required, by the police power of regulating bodies, to provide adequate means for giving service and in the case of a telephone company, in order to have the proper facilities to take care of future demands and build its plant economically, the direction and rate of growth of business in the territory which it covers must be anticipated many years in advance. Any substantial deviation of actual growth from anticipated growth either in the general number of stations or in the number of stations in a particular locality, will mean either idle plant or inadequate plant. The telephone business is unique among public utilities in that there is little overload capacity. The plant must be built to take care of all emergencies.

5. Municipal requirements and legislation. With telephone and other companies occupying public property, replacements due to such causes are often large in amount and may come when least expected.

6. Damage by extraordinary occurrences, such as accidents or the forces of nature.

7. Deferred maintenance, or depreciation due to neglect. Under this heading, may be included neglect resulting from strikes.

8. Combinations of competing companies, which result in duplication and consequent re-arrangement of plant. Such re-arrangement of plant may properly be regarded as supersession, rather than replacement. However, it has an effect on the average length of service of the plant as a whole.

The term "life" as ordinarily applied to physical property has two meanings, which should be carefully distinguished from each other.

The Life of a Plant.

a. The natural life, or length of time which elapses from date of installation to date of replacement, the replacement being made necessary through physical decay or decrepitude or normal wear and tear.

b. The average life, or length of service from the date of installation to date of replacement as determined from past experience and observations on plant installed and in actual service. It may perhaps be defined more accurately as the most probable length of service, taking into consideration some or all of the above causes as well as local conditions which may bring about replacements. The available life tables of various kinds of electrical apparatus and material made up by different engineers and commissions, differ widely. This especially is true of life tables of telephone apparatus and material. It is due in part, to a use of the term "life" to mean in some cases the natural life and in other cases, the life without regard to the effects of obsolescence or inadequacy. Other causes are lack of standardization in manufacture of apparatus, difference in amount and character of maintenance among different companies, and in particular, lack of sufficient data in regard to length of service of apparatus and material which has been installed in the past.

When considering the question of replacements, the term "life" should mean the average life, taking into account all of the factors which may make replacements necessary. Some of these factors have too often been omitted in dealing with the subject of depreciation. From the meaning of the term "average life," it is evidently impossible to give a figure for the average life of the various classes of plant which is more than an approximation. Furthermore, replacements of small units or small parts, will begin immediately after installation. For example, some telephone subscribers' sets may have to be replaced soon after being installed due to damage by fire, accident or to necessary changes in the electrical circuit. The parts of a switchboard, such as plugs, jacks, cords, relays, wiring, etc., must be replaced in small amounts from the time the board is installed to the time it has reached the end of its usefulness. A sleet storm may make necessary the replacement of wires and poles which have been erected but a very short time; electrolysis may destroy a cable after it has been in service but a few years. Thus, replacements due to external or natural causes, begin immediately after apparatus is installed.

On the other hand some plant will remain in service for a longer time than the average. The tendency of this distribution of renewals over a number of years is to smooth out the curve of renewals and to make the estimation of future renewals in time and amount more difficult.

Composite Life of Physical Plant.

In order to treat a composite physical plant as one unit without regard to the separate units of plant of which it is made up, it is necessary to consider its composite life. This may be defined as a period of years such that the total deterioration of the plant during this period will amount to the wearing value of the plant as a whole. The deterioration of plant in this sense includes both replace-

*Abstract of a paper presented at a joint meeting of the electrical section, Western Society of Engineers and the Chicago Section, American Institute of Electrical Engineers, April 22, 1912.

ments and depreciation of existing plant. The composite life has no physical meaning in the sense that the plant will come to the end of its life at the end of the period and that we would consequently have an entirely new plant immediately following this period. It is, however, a convenient way of expressing the effect of depreciation occurring in the plant as a whole.

The estimated amount of deterioration during a period should be the same whether obtained by taking into account each separate class of plant together with its average life, or whether obtained by taking into account the plant as a whole. The actual replacements, however, which will come due at any given time, assuming that the average lives of the different classes of plant are known with some degree of accuracy, can be more closely estimated by using average life figures for each class of plant rather than using the composite life and treating the plant as a whole.

A comparison of the estimated composite lives of a number of different public utilities shows that telephone plants are much shorter lived than plants of other utilities, the average figures as reported by the Wisconsin Railroad Commission being something like 11¼ years for telephone plants, 17½ years for electric lighting properties, 18 years for electric railways, 30 years for a gas plant and 60 years for a water plant.

Moreover, the composite life of a telephone plant will vary during different periods of its growth and development.

Provision for Replacement of Plant.

There are three methods of providing for replacements which may be mentioned.

Method 1: Capitalize replacements. This method, if used to any great extent is indefensible. This has been pointed out many times. It may be remarked in passing, however, that for a rapidly growing plant it may not be as disastrous as for a fixed plant, since the inflation of the plant account in the former case will be relatively smaller than in the latter case.

Method 2: This method consists in treating all replacements of plant simply as current maintenance, regardless of the causes to which they may be due. Only that portion of the cost of replacements which equals the original cost of plant displaced is charged to operating expenses, the remaining portion being considered as an increase to the total plant. Under this method no provision is made in advance for expenditures for replacements.

This method is the usual one with steam railroads and some large street railway companies. It does not, in the writer's opinion, apply to telephone plants without some modifications.

Method 3: This method consists in setting up a depreciation reserve fund, or "Replacement Rerserve" paid in annual installments and such that the total of all contributions with or without interest as the case may be, will amount to the "wearing value" of the original property at the end of its life.

In some cases a distinction is made between a reserve fund for special insurance against sudden and infrequent replacements and a reserve fund to take care of continuous depreciation. It would seem that any plant which is exposed to the elements or which is liable to sudden and unexpected need for reconstruction, should be protected by a special insurance fund. Also the element of chance entering into such matters, would call for an ample margin of safety.

As applied to telephone properties it is believed that the building up of proper reserve funds is the only safe procedure to follow. Current maintenance cannot be sharply distinguished from actual replacements in a plant made up of a very large number of small units. Some of the apparatus which goes to make up a telephone plant is of this kind and replacements of such small parts may be charged to current maintenance. But, in order to adequately provide for sudden and unpredicted replacements of large amounts of plant made necessary by obsolescence, inadequacy, storms, accidents and public requirements to which telephone plant is largely subject, some special insurance in the way of a reserve fund must be provided.

Proper Amount To Be Put Into a Reserve.

One method of estimating this amount is based on an estimate of the composite life of the plant. According to this method, if the composite life of the plant is estimated to be n years then $(\frac{1}{n})$ of the total wearing value of the plant should be put into the reserve each year, assuming that the fund will earn no interest. If the fund earns a given rate of interest, the amount to be put into the reserve each year will be less. Assuming that the fund will earn no interest, it may be shown that this method is equivalent to taking the life of each separate unit of plant and calculating the total sum which should be put into the reserve in order to properly care for all the separate units.

The importance of a proper reserve fund in the case of many such companies was not recognized in the past and an adequate reserve does not exist at present. For such companies there are at the present time, two distinct problems; first, the determination of the proper amount which should be in the reserve at the present time in order to properly take care of replacement of existing plant when it comes to the end of its life. Second, the determination of the proper amount which should be put into the reserve to take care of the replacement of new additions to plant from year to year.

The second problem is perhaps more capable of solution than the first, since in the case of yearly additions to plant we are dealing with entirely new plant with the experience of the past to guide us, and the accounting system may be arranged to enable us to revise our estimate of depreciation from time to time. Even then, the best we can do is to use our judgment and draw on past experience as much as possible in making a reasonable forecast of future life.

In regard to the first problem it may be proposed that we should fall back on an appraisal. But one should not overlook the fact that however well we may be able to estimate the present condition or depreciated value of existing plant and however well we may be able to estimate future life based on present physical condition, no one is able to estimate the effect which obsolescence, inadequacy, public requirements and the forces of nature will have upon the future life of existing plant. Judging from past experience in the telephone field, these factors will have a much greater effect than normal wear and tear or decrepitude.

It has been claimed by some that in the case of an old established plant which has been in service long enough to eliminate the effects of the first period of growth and development of business and where the plant has reached its normal operating state, the amount which should be put into the reserve may be estimated approximately by averaging the cost of replacements for a period of years in the past. That is, if a company operating today finds that annual renewals aside from current maintenance have averaged say, 3 per cent. of the total investment in the last five years then 3 per cent. should be enough on the average to care for renewals in the future.

On account of the rapidity of growth of every telephone company of any considerable size in the United States, and other reasons, it is believed that in hardly a single

instance will the future replacements be reflected in the present and past reconstruction accounts in this way. Estimates of the composite life of telephone plants in large cities, obtained from different sources, vary between 11 years and 14 years. Assuming a salvage value on the plant as a whole of say, 15 per cent. this would mean 7.7 per cent. to 6.1 per cent. of the total investment as the proper amount on a straight line basis to put into the reserve each year to provide for future replacements. It does not follow, however that renewals in a properly maintained telephone plant should average as high as this at the present time. During the first few years of existence of a new and growing plant the cost of renewals will ordinarily be small.

If adequate funds are laid aside for future replacement of plant under the sinking fund method, a considerable amount of money may be accumulated in the beginning years of business before renewals begin to assume large proportions. And if the plant is a rapidly growing one, this excess reserve fund may continue to increase, since renewals form a smaller percentage of the investment than is the case in a fixed plant. A large reserve fund should not influence those having in charge the responsibility of providing for the future to cut down the rate at which the reserve is accumulated, provided this rate has been determined by a careful forecast of the future life. If such funds are certain to be needed at some future time they should be accumulated in advance, so as to be available when the occasion for their use arises.

A lack of appreciation of the these facts both by the public and by public utilities, no doubt has had much to do with inadequate reserve funds in the past.

TELEPHONY TEN YEARS AGO

April 9, 10 and 11, 1902, the first convention of the Interstate Independent Telephone Association was held at the Sherman House, Chicago. In its report of the meeting, TELEPHONY recorded that it was the largest meeting of telephone men ever held at that time, more than 600 being in attendance. Dr. I. A. Lumpkin, of Mattoon, Ill., presided. Papers were read and addresses made by C. F. Bennett, Waterloo, Ia.; Richard Valentine, Janesville, Wis.; H. C. Raney, Fairfield, Ia.; L. A. Frazee, Connersville, Ind.; W. W. Low, Chicago; E. M. Coleman, Louisville, Ky.; E. R. Conkin, Aurora, Ill.; W. H. Crumb, Chicago; Dr. H. S. Herr, Ottumwa, Ia.; Mrs. A. M. Brett, El Paso, Tex.; A. L. Hutchinson, Weyauwega, Wis. The officers selected were: President, H. C. Raney, Fairfield, Ia.; vice-president, Dr. I. A. Lumpkin; secretary, E. M. Coleman; treasurer, J. C. Harper, Madison, Wis.

Executive Committee: H. K. Cole, Owensboro, Ky.; J. B. Ware, Detroit, Mich.; Chas. E. Hull, Salem, Ill.; Geo. N. Bandy, Perry, Ia.; J. W. Layne, Carthage, Mo.; A. L. Hutchinson, Weyauwega, Wis. The banquet, of which the late J. J. Nate was toastmaster, is still remembered as one of the liveliest events in the history of telephone conventions.

At the 1902 convention of the Wisconsin Independent Telephone Association, President A. L. Hutchinson reported there were 160 Independent companies in the state. Incomplete reports showed there were 17,763 stations in operation, which number, he estimated, would be increased 25 per cent. if all companies had made returns. By way of comparison, TELEPHONY's Directory for 1912 shows that Wisconsin now has 859 companies.

In March, 1902, the Chicago, Milwaukee & St. Paul Railroad made a special test of the train telephone system of communication with the general offices over telegraph wires. The test was successful.

Early in the spring of 1902, the long distance telephone systems of France and Italy were connected and greetings between French and Italian government officials were exchanged.

B. G. Hubbell, then president of the Independent telephone company, of Ithaca, N. Y., announced in March, 1902, that an Independent line would soon be opened between Ithaca and Binghamton.

TELEPHONY for 1902 printed an item containing well known names in the industry, describing a "smoker" held April 18, 1902, at the Union restaurant, by representatives of the Kellogg Switchboard & Supply Co. Among those present were W. W. Dean, Kempster B. Miller, Joseph C. Belden, C. P. Belden, William Kaisling, C. P. Platt, S. C. Platt, L. J. Herbison, R. H. Manson, C. S. Webster, F. J. Dommerque, J. D. Edwards, E. Krause, J. C. Lewis, F. L. Martin, C. A. Simpson and W. A. Willard.

April 16, 1902, the telephone manufacturers took steps to organize an association.

In April, 1902, the Kansas City Home Telephone Co. broke ground to build its plant.

The following table shows the 1902 census reports of the number of Independent telephone exchanges in the various states that year, and the number of companies in 1912, as recorded in TELEPHONY's 1912 directory:

	Exchanges 1902	Companies 1912
Arkansas	104	234
Georgia	80	180
Illinois	735	1109
Indiana	530	845
Iowa	642	3787
Kansas	236	929
Kentucky	107	512
Maryland	64	91
Michigan	326	947
Minnesota	223	922
Nebraska	143	796
New York	305	1372
N. Carolina	118	268
N. Dakota	45	461
Ohio	599	898
Pennsylvania	409	774
Texas	216	669
Virginia	125	316
West Virginia	153	313
Wisconsin	254	859

In April, 1902, Senator Lodge introduced a bill in the United States senate to permit a new telephone company to operate in the District of Columbia. The company was known as the Telephone Company of America. It did not get very far. That other Massachusetts senator, W. Murray Crane—elected since 1902—would hardly allow such a bill to get very far now, either, as he is known to be a heavy Bell stockholder.

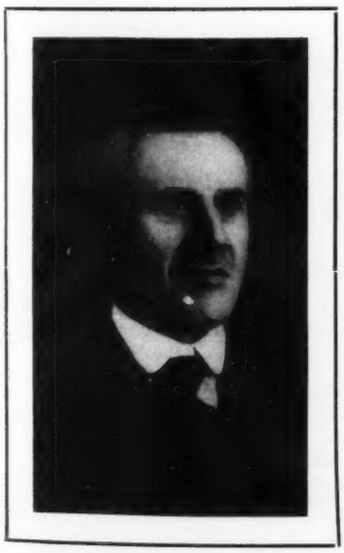
In the spring of 1902 the Southern Independent Telephone Association, was organized at Charleston, S. C., with the following officers: President, F. V. L. Turner, Atlanta, Ga.; vice-presidents, W. G. Brorein, Tampa, Fla.; W. B. Moore, Yorksville, S. C.; W. W. Shaw, Durham, N. C.; secretary and treasurer, P. D. Langdon, Augusta, Ga.

A Quartet of Men Prominent in the Telephone Field

THOMAS BROMLEY, JR., general manager of the United Home Telephone Co., Ludington, Mich., was born in Gaines, Mich., March 16, 1867 and began his business career at the age of fourteen, as relief operator in a railroad office, 1882-3; in 1884-5 was ticket agent at Grand Rapids, Mich.; from 1885 to 1890 was bookkeeper for St. Johns Mfg. Co., St. Johns, Mich. During 1890-2 he was settling the estate of a deceased banker; was general manager of St. Johns company from 1892 to 1902. In September, 1896, became director and secretary of Union Telephone Co., of Alma, Mich.; general manager in 1902. Organized Delaware & Madison Telephone Co., Muncie, Ind., taking over its management in September, 1903, which he continued until 1906, since when he has been connected with the United Home or its predecessor, the Lake Shore company, of Hart. In February, 1911, was made general manager of Citizens coompany, of Muskegon. Director Michigan Independent Association. Member of Elks, K. of P. and Century Club, of Muskegon.

FRANK B. COOK, of Chicago, inventor and manufacturer, was born in Monroe, Mich., October 18, 1855. Before taking up telephone work he was employed as a cabinet maker. Naturally of an inventive turn of mind, and being a thorough mechanic, he worked out during that time a number of devices which were patened and which yielded him a considerable return. His first telephone work was undertaken in 1878, when he was engaged in setting up and testing telephone lines for Wm. Kline, superintendent of telegraph of the L. S. & M. S. Ry., at Toledo, Ohio. He started regular exchange work June 15, 1879, for the Toledo Telephone Exchange Co., at Toledo, later absorbed by the Central Union Bell. He began work as foreman of construction, filling various positions later up to and including that of chief engineer, having charge of all equipment and construction in a territory comprising some 200 exchanges, in four states. Resigned in 1896 and began manufacture of telephone apparatus, mostly of own invention. Mr. Cook is a member of the Chicago Automobile Club.

HENRY A. FRIER, president and manager of the Russell Telephone Co., Russell, Kans., was born in Mokena, Will county, Ill., February 22, 1855. His education was scanty, being mainly picked up during winter terms of country school. Mr. Frier's business experience may be summarized briefly as follows: Farmed until 1883, with short intermission working at tinner's trade; then quarry boss and shipping clerk for B. & E. Stone Co., Chicago, two years; moved to Kansas in 1885 and engaged in stock raising until 1889; appointed receiver for Russell Hdwre. Co. and bought the stock in 1890, firm Frier & Root; bought Root out next year, new firm Frier & Ham; later Frier & Gower, until January, 1905, in August, 1905, bought Russell Telephone Exchange; formed stock company in April, 1910, becoming president and manager. Mr. Frier has been vice-president of the Farmers State Bank since its organization in 1903. He was mayor of Russell from 1903 to 1905. He has greatly increased the local telephone business and built many country lines. He is a Mason.



ROBERT MILLER, general manager of sales for the Indiana Steel & Wire Co., Muncie, Ind., was born in Ridgeville, Ind., April 24, 1870. Leaving school at an early age he up took several lines, stone and brick mason's trade, saw mill and timber business, section work, etc. He finally learned telegraphing and freight and ticket handling, continuing in those lines until the spring of 1893, when he left the employ of the railroad company to enter that of Kitselman Bros., of Muncie, manufacturers of fence, fence machines and supplies. He began there as bookkeeper, later selling goods on the road and, still later, becoming sales manager. In 1902 the Indiana Steel & Wire Co. needed a general sales manager to succeed Herbert Clifford and Mr. Miller was selected for the position, which he has since held. He is a member of the Elks, the K. of P., the U. C. T. and the T. P. A. He has planned all the selling campaigns of the Indiana company since he went with that organization and is a firm believer in the power of intelligent, well-directed advertising as a producer of results.

San Francisco's Automatic Private Branch Exchanges*

Description of the Apartment House and Commercial Private Exchanges—Traffic Data—Initial Cost of Branch Exchange Equipment—Annual Costs Including Maintenance, Operating, Depreciation, Taxes, Interest and Miscellaneous Items—Comparison of Annual Costs

By Gerald Deakin

Local calling, in the commercial exchanges, affords some interesting data regarding the capacity of the mechanical operators to handle a heavy traffic. While these installations are limited in number, they are, however, all made in representative organizations, which, for the most part, are among the largest and most important of their kind. The hourly traffic of five installations is graphically shown in Figs. 2 and 3, Curves for the same installation but for different days, show an unexpected similarity. It will be seen that the traffic in installation 21 (Fig. 3), a large daily newspaper, continues pretty well through the night, in fact the busy hour is so included. On the other hand, the traffic of the remaining installations originates almost entirely between the hours of eight in the morning and six in the evening.

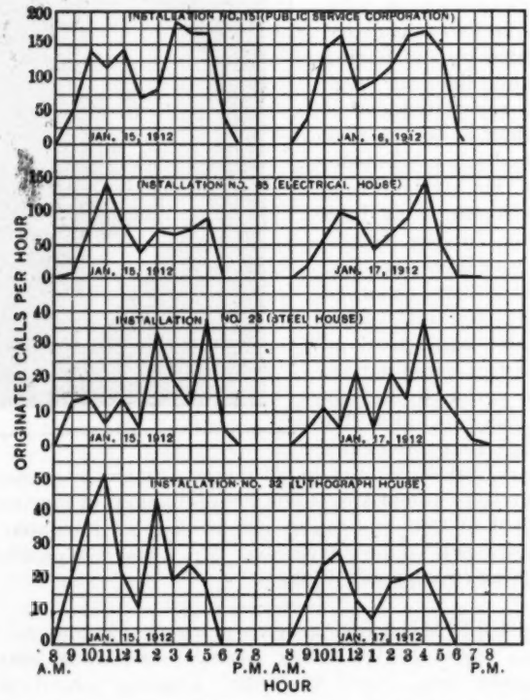

INSTALLATION NO. 15 (PUBLIC SERVICE CORPORATION)
JAN. 15, 1912
JAN. 16, 1912
INSTALLATION NO. 35 (ELECTRICAL HOUSE)
JAN. 16, 1912
JAN. 17, 1912
INSTALLATION NO. 29 (STEEL HOUSE)
JAN. 15, 1912
JAN. 17, 1912
INSTALLATION NO. 32 (LITHOGRAPH HOUSE)
JAN. 15, 1912
JAN. 17, 1912
ORIGINATED CALLS PER HOUR
8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8
A.M. P.M. A.M. P.M.
HOUR

Fig. 2. Hourly Traffic of Business Houses—Originated Calls.

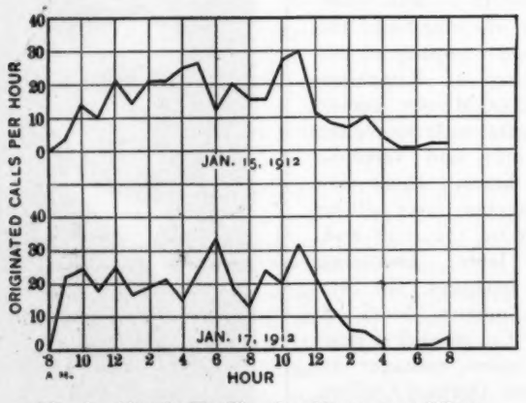


Fig. 3. Hourly Traffic of a Newspaper Office.

A total of three hundred or more observations were taken at seven of the commercial installations in order to determine the average length of conversation and the speed of operation on local connections. The average results in seconds for each installation are given in the table, Fig. 4.

In the second column of this table is given the elapsed time between the removal of the receiver, as indicated by the plunging in of the line switch, and the selection of the line called, as indicated by the stepping of the side switch of the mechanical operator into its third or final position. The average time required to answer is given in the next column and in the next two columns, the average length of conversation and the total elapsed time, respectively. It will be seen that the average time required to establish a connection between the calling and called lines is but 2.1 seconds. Compare this with 3.5 seconds, the average time required by an "A" operator in a well maintained manual system, to answer a call under normal operating conditions. This latter figure, furthermore, applies to central offices of the most modern type, and it will be admitted without argument that the average time of answering in manual private exchanges, in which heavy overloads are frequent, is much longer. From these remarks, it will be seen that it takes less time to establish a local connection in an automatic private exchange system, than is required by an operator to even answer a call in a manual system.

Installation Number	Average To Call	To Answer	Talking	Total
15	2.17	10.	59.6	71.77
19	2.2	7.2	62.4	71.8
21	2.2	10.4	54.2	66.8
30	1.9	11.	33.5	46.4
31	2.0	9.7	54.5	66.2
32	1.8	12.	32.1	45.9
35	2.4	7.7	41.5	51.6
—	2.1	9.7	48.2	60.0

Fig. 4. Average Lengths of Conversations and Rapidity of Connections.

The following represents the average performance of the mechanical operators of installation No. 15, a typical traffic curve for which is shown in Fig. 2.

Number of mechanical operators	8
Number of stations	75
Originated calls per working day	1,150
Average rate of calling per station per working day	15.3
Originated calls, busy hour	180
Ratio, busy hour, to entire day, per cent	15.5
Originated calls per mechanical operator per busy hour	22.5
Originated calls per month of 26 days	29,900
Average overflow calls per month (Average for 4 months, minimum 181, maximum 285.)	230
Ratio of overflow to originated calls, per cent	0.77
Total originated calls per year	359,000
Total calls per mechanical operator per year	45,000

Sufficient data has not yet been obtained to determine with any degree of accuracy the capacity of the "in" and "out" automatic trunks. The number of trunks in commercial installations

*Abstract of a paper presented at the Pacific Coast meeting of the American Institute of Electrical Engineers, Portland, Ore., April 16-20. Concluded from issue of April 20.

is more or less arbitrary, and depends upon how many the subscriber is willing to pay for. In apartment house installations, two "out" and one "in" trunks have been provided for 25 line installations and two "out" and two "in" for 50 line installations.

First Costs.

The first costs of apartment house automatic switchboards placed in position, ready for operation, are shown in Fig. 5, curve *A*. These costs include all factory and shop labor and

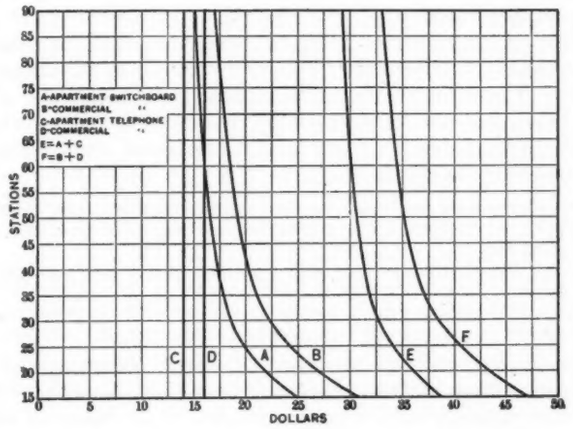


Fig. 5. First Costs per Station—Automatic Installations.

material, storage battery, all miscellaneous power wiring and the installation labor and material necessary to place the boards in actual service. The corresponding costs of commercial automatic private exchange switchboards are shown by curve *B*. The first cost of apartment house and commercial telephones installed are shown by *C* and *D*, respectively, the former includes in addition to the telephone, installation labor, but not wire. The commercial telephone costs, curve *D*, include both installation labor and wire. The summation of these first costs of apartment house and commercial installations are given by *E* and *F*, respectively. The switchboard costs refer to locally made boards, in the manufacture of which high priced day labor was used. It is, therefore, reasonable to assume that a considerable reduction in these costs could be made were the boards to be manufactured in a large factory especially adapted for the purpose.

The corresponding costs of manual private exchange installations, are shown in Fig. 6. The first costs of apartment house and commercial switchboards, curves *A* and *B*, respectively, include the switchboards installed and connected, ready for immediate operation. They do not, however, include storage batteries, since the majority of such boards obtain their current supply from the nearest central office over a group of cable pairs. The first costs of apartment house and commercial telephones installed, are shown by *C* and *D*, respectively, and the total costs of complete installations by *E* and *F*, respectively. In the preparation of these costs, the prevailing prices of the Independent manufacturers of telephone apparatus were used.

Neither Figs. 5 or 6 include any central office costs, overhead charges, underground or aerial cable costs, nor the cost of the lateral into the building and its associated main terminal.

A comparison of the costs shows that for the largest installations, the automatic system is approximately 60 per cent. more costly than the manual system and for the smallest installation 85 per cent. more costly.

Annual Costs.

Item 1. *Maintenance Labor.* Up to the present time, data collected from 26 installations show that the average labor cost of maintaining commercial automatic private exchange installations, both switchboards and telephones, is approximately $3 per station per year, and of apartment house installations, $1.18 per station per year. The Bay Cities Home Telephone Co. operates, in addition to the automatic private exchanges, a large number of manual private exchanges. From the data afforded by these installations, it is estimated that the average labor cost of maintaining commercial manual installations, exclusive of calling device trouble, is approximately $1.50 per station per year, and of apartment house manual installations, $0.60 per station per year. None of these figures include overhead charges and supervision, nor do they include the cost of operating and maintaining the central office plant and the underground and aerial cable systems. The difference between the charges for the commercial and apartment house installations may be attributed to the fact that the traffic, with the resulting wear and tear, is much heavier in the commercial installations.

Item 2. *Depreciation, Interest and Taxes.* The average life of manual private exchange switchboards is considered, I believe, by the Bell companies, to be approximately 10 years, which would make the depreciation of this class of equipment 10 per cent. This comparatively short life is due to the fact that the switchboard is exposed to extremely rough and severe usage. The items which receive exceptionally hard service are the highly finished cabinet, plugs, cords, jacks and keys. Much of the latter equipment is soon broken and worn beyond repair. The refinishing of a cabinet for a new or re-installation is costly. The automatic switchboard, on the other hand, includes a practically indestructible metal framework, which affords complete protection to the automatic apparatus located within. This apparatus contains no parts, which when worn out, require the replacement of the whole. Those parts subject to wear are not costly and are easily replaced, and in fact are replaced as part of the regular maintenance work. Furthermore, automatic apparatus is not handled in the sense that manual apparatus is handled, which permits the wear and tear to take place in the parts designed to allow for such wear and tear. From these remarks it would seem reasonable to assume that an automatic switchboard will outlast a manual switchboard to a considerable extent and in this paper, a depreciation charge of 8 per cent. will be used. The necessity for even this charge is

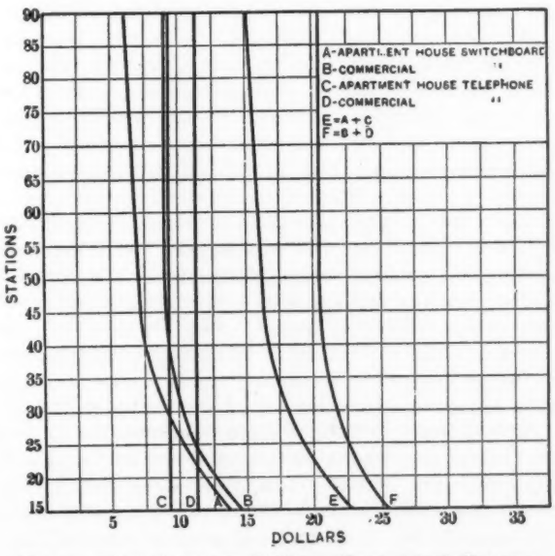


Fig. 6. First Costs per Station—Manual Installations.

primarily to provide for changes in the art which may require the replacement of the switchboards, or parts of them, before they are actually worn out. Including average interest at 3½ per cent. and taxes at 1½ per cent. it will be seen that the total of the three items in question, for automatic and manual switchboards, is 13 per cent. and 15 per cent., respectively.

Depreciation, interest and taxes on telephone apparatus has been taken at 17½ per cent. for both automatic and manual.

The figures previously given allow for an increase in the maintenance of the automatic telephone to care for the calling device.

Item 3. *Current Supply and Miscellaneous Costs.* For a year of 312 working days, it can be shown from direct meter readings, that the average cost of power consumed in commercial automatic installations at 4 cents per kw.-hr. by one call per day

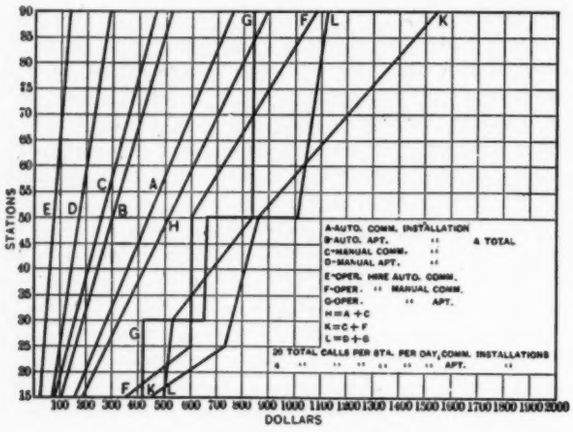


Fig. 7. Comparative Annual Costs.

for one year, is 2.5 cents. It may also be shown, on the basis of a year of 365 days, that the annual cost of the power consumed in an apartment house automatic installation at 4 cents per kw-hr. by one call per day, is approximately 5 cents. The difference between these two figures may be attributed to the fact that in the latter system considerable power is wasted in maintaining the batteries in their proper condition. In addition to the cost of power consumed, each installation must be charged with the annual cost of four cable pairs, one for charging, one for the busy tone and ringing interrupter, one for ringing power, and one for supervision. The average length of cable circuit is estimated at one-half mile, which at the present time conforms very closely to the actual conditions prevailing in San Francisco. The total annual cost of No. 22 B. & S. gage cable including all charges is taken at $3 per pair per mile, which makes the total annual cost of the four pairs $6.

Power for manual private exchange switchboards, within a radius of one-half mile is almost invariably supplied from the nearest central office storage battery over a group of cable pairs. Within this limit, such an arrangement is nearly always the most economical. The average power consumed per connection, by the manually operated private exchange switchboards of the Bay Cities Home Telephone Co. is 0.1 watt-hr. and with power at the storage battery bus bars at 5 cents per kw-hr. amounts to approximately 0.156 cents per year, for one call per day—a negligible amount. Since the size and cost of feeders depend upon the average maximum instantaneous current requirements, it is essential that the ratio of the busy hour to the entire day be known. Here the ratio of 15.5 per cent. derived from the data afforded by installation 15, will be taken. This is somewhat lower than the ratio met with in most private exchanges, and therefore, favors the feeder method. Upon this assumption it can be shown that the annual cost of a feeder, one-half mile in length and serving a manual private exchange switchboard of the type used by the Bay Cities Home Telephone Co. is approximately 1.63 cents per call per day.

In addition to these two costs, each manual installation must be charged with $1.50 as the annual cost of the cable pair supplying ringing generator current.

Item 4. *Operating Costs.* Automatic Apartment House Systems.—No operator required. Commercial Automatic Systems.—In, out and local calls are assumed equal. This at once eliminates the operator from two-thirds of the total calls. It is estimated that 80 per cent. of the remaining in-calls will be made direct, which leaves but 6.7 per cent. of the total calls to be handled by an operator. The few calls of this nature, in most installations, may well be handled by a clerk who has other duties to occupy his or her full time. Upon the assumption that the average salary paid such a party is $45 a month and that with full time devoted to operating, 500 calls a day can be handled, it will be seen that the cost of handling each call is 0.35 cents.

Apartment House Manual Systems.—The rate of calling is not a controlling factor in determining the cost of operator hire in apartment houses served by manual switchboards. The quality and extent of service is largely dependent upon the management. The more pretentious apartment houses generally give the more extensive, and therefore, more costly service. The following schedule is based upon observations made in and around San Francisco.

30 apartments or less, one day operator at $35 per month. Evening service given by proprietor, janitor or elevator boy, as the case may be.

31 to 50 apartments, one day operator at $35 and one night operator to 10 p. m. at $20, a total of $55 a month.

Above 50 apartments, one day operator at $35 and one night operator to 12 p. m. at $35, a total of $70 a month.

Commercial Manual Installations.—Data collected in San Francisco show that the full time of an operator is required for private exchange work when the number of all classes of connections handled per day is between 500 and 1,000. With less than 500 calls an operator may devote her spare time to other duties.

It is estimated that $45 is a fair salary for a first class commercial private exchange operator. This sum, however, is less than the average received by operators in San Francisco, concerning which information has been obtained.

Comparison of Annual Costs.

Corresponding annual costs of automatic and manual private exchanges are given in Fig. 7. Those costs pertaining to commercial installations apply in particular to exchanges equipped to handle a total of approximately 20 in, out and local calls per station per day. Two in and two out calls per station per day are provided for in the costs of the apartment house installations.

Curves *A* and *B* represent the summation of all costs included in items 1, 2 and 3, for commercial and apartment house automatic installations, respectively. Curves *C* and *D* represent the corresponding costs of manual installations. The costs of operator hire, item 4, in commercial automatic installations, are given by *E*, and in commercial and apartment house manual installations by curves *F* and *G*, respectively. Curve *H* gives the total annual costs of commercial automatic installations including operator hire. Curves *K* and *L* give, respectively, the corresponding costs of commercial and apartment house manual installations.

The most striking feature in the results set forth in Fig. 7, that the cost of private exchange operator hire alone, in manual installations, is greater than the total annual cost of operating and maintaining automatic installations. Considering the total costs of each it will be seen that the annual costs of the manual system are from 70 per cent. to 300 per cent. greater than the annual costs of the automatic system. Eliminating operator hire, the annual costs of the automatic system is from 60 per cent. to 90 per cent. greater than the manual system.

Recapitulation.

The elimination of or reduction in operator hire, made possible by the installation of automatic equipment, results as has been shown, in a saving more than sufficient to pay for the entire cost of maintaining an automatic exchange. The complete elimination of the operator from apartment house installations might be objectionable were it not possible to make use of the information bureau, a department maintained by every telephone company. The results obtained in San Francisco show that the

increase in cost of operation necessary to properly handle information calls for the occupants of apartments, is negligible. Where the period of occupancy is more than a few months, "extra listing" in the directory affords the tenant the equivalent of main line service in every respect. The substantial elimination of the private exchange operator by the installation of automatic private exchanges affords the telephone company an additional source of revenue—an opportunity which should not be overlooked—for it has been shown that the maintenance and first costs of automatic exchanges are materially higher than manual exchanges, thus permitting higher rates with a saving to the subscriber and a greater return to the telephone company for a given number of stations.

It is well to note that the introduction of automatic private exchanges into automatic exchange areas does not require a change in operating methods, the subscriber is merely required to call from one to three additional digits each requiring on an average, an addition of one second to the calling time. Other than this the subscriber handles the call in every detail, as though it were being made from one main line to another. Patrons to main line manual service, and to the well-known multi-key intercommunicating private exchange service, do not object to getting numbers themselves. It is, therefore, reasonable to assume that patrons to manual private exchange service would likewise not object, providing the introduction of the manual private exchange did not introduce additional delays and more cumbersome operating methods. To illustrate more clearly the simplicity of calling in the automatic system and the multiplicity of indirect calling in the manual system, in both cases from and to a private exchange I beg to call attention to the tabulation Fig. 8, in which the time required by the different stages of the calls are given. The figures with reference to speed of operation in the manual system represent the average of good service in a large, well maintained multi-office exchange. It has been assumed that private exchange and central office operators are equally efficient, a condition not realized in actual practice. I believe that not even the most ardent advocate of the manual system will disagree with me when I say that at least 15 per cent. of the total originated calls in any well run manual exchange require from 4 to 12 seconds or more to answer. If this is so, a corresponding greater number of delays must be expected when three operators are involved. All delays of this nature are eliminated by the automatic system.

	Automatic System	Manual System
Calling number, 8 digits	8 sec.	
Answering first P. B. X. operator.		3.5 sec.
Giving instructions and making connections		8.5 "
Answering "A" operator		8.5 "
Making connections in central office (80 per cent. trunking)		13. "
Answering second P. B. X. operator		3.5 "
Giving instructions and making connections		8.5 "
Answering subscriber (from preceding traffic data)	9.7 sec.	9.7 "
Ringing and answering of calling subscriber		3.5 "
Conversation (from preceding traffic data)	48.2 sec.	48.2 "
Disconnection P. B. X. operator		3.5 "
Disconnection "A" operator		3.5 "
Total elapsed time	65.9 sec.	108.9 sec.

Fig. 8. Analysis of Time Required for Calling.

Upon the assumptions given it will be seen that the total time involved in a connection through the manual system is 65 per cent. greater than in a connection through the automatic system. It will also be seen that in the latter system the subscriber is required to wait but 17.7 seconds for an answer as against at least 50.2 seconds in the manual system. Furthermore, in the automatic system, the busy tone, in case the line called is busy, is obtained in eight seconds, whereas 45 seconds must elapse before a similar report can be obtained through a manual system.

Even though the indirect method of calling is not deemed necessary in an automatic system, it can, however, be provided for where conditions require, as is illustrated by the special arrangements made in one installation, whereby the clerks of certain officials establish the outgoing exchange connections and answer the incoming exchange connections. The local calls only are originated and answered by the officials. The desired result is obtained by placing two ringers on each line, one at the clerk's desk, adapted to ring on incoming exchange calls only, and the other on the official's desk adapted to ring on local calls only. Secrecy is afforded by causing the clerk's telephone to be automatically cut off when the official is using the line. The circuit is further adapted to permit the official and clerk to converse without being overheard by a calling party.

Character, Trouble	Installation No. 15 No. of Cases	Installation No. 15 Per cent. of total		Installation No. 21 No. of Cases	Installation No. 21 Per cent. of total	
C. O. Switchboard	2	.9		none		
P. B. X. Switchboard	43	19.4		15	24.2	
Calling device	50	22.6		6	9.7	
Broken and bent station apparatus	35	15.85	54.3	13	21.0	45.2
Other station apparatus trouble	35	15.85		9	14.5	
Inside wiring	1	.45		1	1.6	
U. G. Cable	none			none		
Misuse	3	1.35		none		
Slow to answer	5	2.3		2	3.2	
Don't answer	5	2.3		1	1.6	
O. K. on test	42	19.0		15	24.2	
Total	221	100		62	100	

Fig. 9. Complaint Record of Two Installations.

Secrecy on all connections, instantaneous disconnection upon hanging up and the fact that the full value of the service is available 24 hours each day and every day in the year, are all arguments for the automatic private exchange.

Calls for toll or long distance service from an automatic or in fact any private exchange, must be checked by some responsible party, if abuse of this service is to be prevented. In San Francisco an automatic private exchange subscriber calls the toll operator in the usual way, which operator in establishing the connection refers the call back to the receiving cabinet operator, who takes note of it and extends the connection to the originating station. Correspondingly simple methods have also been worked out to rapidly handle "two-number" business.

The final test of any public utility is its ability to satisfy the public and from this viewpoint the automatic private exchange has not been found wanting. A complete record of all complaints received from all sources is kept by the Bay Cities Home Telephone Co. During the operation of installation 15, which covers a period of eight months, 173 complaints were received resulting in 221 recorded cases of trouble and comments, which, together with the record of installation 21 for four months, are given in detail, Fig. 9.

Complaints from installation 15 average one for each 1,400 originated calls and from installation 21, one for each 1,480 originated calls. During the entire year of 1911, 29 complaints were received from apartment house installation 1, an average of one for each 450 outgoing calls. These complaints might easily be a serious matter were their nature such as to interfere with the service of the installations as a whole. An examination of all records does not reveal a single case where an entire switchboard was put out of service. On the contrary, substantially all trouble affected but one line or one trunk. The records of installations 15 and 21 show that the actual private

the trouble due to broken and bent station apparatus, caused by rough handling on the part of the subscribers. One station of installation 15 shows a record of three new receiver shells in one month. Of the 173 complaints received, from installation 15, all were recorded O. K. within 11½ hours, 94 per cent. within 6 hours, 80 per cent. within 3½ hours, 70 per cent. within 2 hours, 45 per cent. within 1 hour, and 11 per cent. within 15 minutes, which 11 per cent. includes all of the more serious troubles, such as a sticking switch or a blown fuse.

The automatic private exchange may, with slight modifications, be readily adapted to manual exchange areas. In such areas it would afford direct intercommunication and direct outgoing exchange service. Obviously, all incoming calls would have to be made through the receiving cabinet, unless the central office operators were provided with a means of calling.

An automatic private exchange switchboard can easily be adapted to serve any number of exchanges within its capacity; for example, a 90 line board could be installed in an office building and adapted to serve nine 10 line installations or it could be installed in some one apartment house and adapted to serve six 15 line installations. With a switchboard so arranged, it would also be possible, where a number of small apartment houses or flats are erected within the same block, to place a receiving cabinet in some one apartment house and allow it to serve all houses, the proprietors of the different houses sharing the expense.

While the automatic private exchange may be considered a success in the larger cities and towns, the development of automatic apparatus in general, has not yet reached the stage where it may be placed in localities which cannot afford ample skilled labor to look after it. Automatic equipment, like a watch, need not require much attention but when attention is required, quality and not quantity should be considered. It should not be inferred from this that skilled labor is hard to get in the larger cities, for if San Francisco may be taken as an indication of what may be expected elsewhere, it is not. The work is interesting and ambitious men take to it readily. There are, no doubt, many other conditions under which the automatic private exchange is not yet fitted to give the best service, but the installations referred to in this paper, demonstrate, I believe, beyond a reasonable doubt, the ability of the automatic private exchange to satisfactorily serve the average commercial organization and apartment house in a more economical manner than is now possible with the manually operated private exchange.

First Dallas Directory Is Issued.

The Dallas (Texas) Automatic Telephone Co. has issued its first directory, containing the names of over 1,000 subscribers. In its announcement in the new book, the company states that instruments are now being installed at the rate of more than fifty per day and that it is anticipated that, by June 1, at least 5,000 telephones will be connected and working. The announcement continues:

> The construction and installation of the automatic telephone plant is proceeding with satisfactory results, regardless of the magnitude of the enterprise. Many miles of underground subway have been installed; millions of feet of underground wires are being placed in these subways; also, the overhead work, consisting of poles, wires and cables, are being constructed in a satisfactory and efficient manner. The switching apparatus necessary has been installed in the main exchange and is being rapidly installed in the other four branch exchanges. All this requires considerable time, but, when completed we will be proud of our undertaking. It will furnish the city of Dallas a complete, modern, up-to-date telephone service, that has long been needed and will be greatly appreciated.

The directory contains forty pages, besides the cover. It is attractively printed on a rough paper, with heavy paper outside. A notable feature is the listing of some of the large department stores in Dallas, which have P. B. X boards, with telephones in every department, an entire page being given up to each. In addition, one of the stores has used the outside back cover in a further classified arrangement of its numbers.

Fairbury, Nebraska, Company to Sell to Lincoln.

The stockholders of the Fairbury (Neb.) Telephone Co. have voted to sell the property of the corporation to the Lincoln Telephone & Telegraph Co. The latter will either pay cash for the local company's stock, or will exchange it for its own.

Chicago Independent Traffic Doubles.

The local traffic of the Illinois Tunnel Co., operating the Independent system in Chicago, has doubled within the past ninety days, according to the statements of its officers. During the same time the long distance business

My! How You Have Grown!
Local telephone traffic, via Automatic, has practically doubled in ninety days—90% increase in local calls is the record.
In the same time long distance calls increased 60%—a remarkable evidence of the popularity of the
AUTOMATIC TELEPHONE
Better, quicker, cheaper service is the explanation. Low long distance rates, 2½c public phone calls, efficient service and secrecy are some of the Automatic features.
Firms throughout Chicago are rapidly installing Automatic Telephone inter-communicating systems to put a phone on every desk. The service is growing by leaps and bounds. Now is your time to order an Automatic Telephone. Do so to-day.
Illinois Tunnel Company
AND CONNECTING COMPANIES
(Independent)
162 W Monroe St. Contract Dept. 33-111

Announcement of Expansion in Chicago.

increased 60 per cent. This phenomenal record has been set forth by the company in display advertisements in the local papers, the attached reproduction showing one of these.

Syracuse Opposes Bell Rates.

The issue between the city of Syracuse, N. Y., and the New York Telephone Co. is now joined. The comptroller has refused to pay the bills rendered and is prepared to fight any suit instituted by the company to collect them. The rates for business telephones have been raised from $48 to $60. No appeal will be taken to the Public Service Commission, but the matter will go directly into the courts and a judicial determination had.

The city is determined to begin an action in equity for the annulment of the franchise if the company persists in the increased rates.

Mere Size

Does It Mean Security?—Is It a Guarantee Against Disaster?—Some Lessons

By J. C. Kelsey

The Titantic was the last word in ocean travel. This leviathan of the deep was the masterpiece of human ingenuity.

It had bathing pools, tennis courts and theaters. Exclusive walks were furnished so that the delicate rich should not brush the vulgar sleeve of the poor. Not one moment of ennui was allowed to the most highly developed wealthy one.

This great boat had powerful engines and those who bought tickets for her maiden trip felt as safe as if they were at home.

Her officers knew that great icebergs were in front of her. But no one believed that the ocean had anything on this gaily-lighted ship.

But the final shriek of despair from 1,600 throats that rose into the affrighted air told the world that size is not all.

The Titantic was a giant, but she was short on life boats. She had no safety reserves.

Think of the industrial lesson we may learn. Running a business without reserves. That is exactly like a ship with no life boats. It is the same whether the ship be small or large, or whether the business is small or large.

Here in America we have grown into a mental condition where we are over-impressed by size. We are told that great size in a corporation is an extraordinary asset. That great size is a security against financial disaster.

And success apparently accompanies some of the great concerns just as security apparently attended the Titantic —until she struck.

The officers of that ill-fated steamship company also showed the world some of the characteristic stupidity of average great corporation servants.

They did not want the senate inquiry to detain the sailors because sailors' boarding houses in New York were very dangerous.

Such a foolish excuse should never have been spoken. But I have heard the representatives of other concerns make equally silly excuses in trying to dodge inquiry into their criminal carelessness.

Too bad to risk the sailors in New York lodging houses after the Titantic proved so safe!

But a great ship sailing in all the glory of its topheavy luxury reminds me of certain American corporations, sailing on the industrial sea, with extravagant ways, and defying public opinion.

These corporations overcharge the people in places where they can, and undercharge in other places where competition exists. They buy up competitors and with the trained hand of a bandit, destroy the property and fasten monopoly upon the public.

They point with pride to their legal department which allows them to break the law with impunity.

Their huge size and apparent money power also influence counts. And decisions of courts help them on their way. The stockholders are told once a year how great and how grand the company is becoming.

Did it ever occur to you that a great industrial company, putting millions of dollars into physical property every year, and neglecting depreciation, is something like a ship with icebergs ahead?

A corporation of great size is always confronted with lowering earnings, increasing property and increasing liability.

When the disaster comes will there be enough real reserve to save the stockholders? Or will there not be reserve boats enough?

It is no laughing matter, this question of the rainy day for the individual, for the ship, or for the great corporation.

No one doubts the utter necessity of providing for the rainy day that sooner or later comes to the individual. And no one doubts the necessity of the individual conducting his life so as to avoid disaster.

He must be a good citizen, conform to the laws, be cautious and not fight headlong against the public good. He must have something else beside his rainy day fund.

Likewise a ship must have something beside life boats. In good weather, these may be useful, but in stormy weather they are useless.

A ship must have its officers on the lookout, and avoid disaster.

Disasters are mostly voluntary. A disaster like that which overtook the Titantic was not an involuntary one. It was not like Galveston, or Mt. Pelee, or San Francisco.

It is more like the Iroquois Theater fire, in Chicago, or the General Slocum disaster, in New York. All voluntary. In other words, they could have been avoided.

Great corporations likewise need something besides reserves. They must not defy laws nor public opinion. They must live more in accord with the trend of the public mind.

There is no need of any great corporation in America striking the iceberg of public opinion. Disasters coming to them are purely voluntary. Because they do not see them, or will not see them, from the bridge. They are defying the opinions of others, and paying no attention to the Marconigrams flashed to them as they speed by.

They do not even respond with thanks to a word of warning. They are too flushed with the wine of the evening dinner, and too bent upon making a new record of conquest.

Such a condition can almost be expected from any concern guided from New York. The nervous system of a New York life is a poor equipment for the successful guidance of any corporation which has property scattered all over the country.

They will not understand the signals of icebergs. They are too important for such trivial collisions. Nothing can stop them.

I have in mind the universal telephone idea—that company with a single thought, universal telephone control.

Control of all telephones in America is a dream of the

past from which a few men have never awakened. These men had left the Bell ship in the days of monopoly. They were called back when this Bell ship, with distress signals plainly flying, struck the iceberg of Independent telephone competition.

The Bell ship is one of immense size. It cost nearly a billion dollars. It is a very impressive ship, too.

Most of its crew and its passenger list of stockholders feel very secure. The average American banker and business man sometimes is awed by its financial solemnity.

If you would suggest any possible disaster, they would promptly tell you that such a ship could not sink.

The Bell ship did strike the iceberg of Independent telephone competition. Because of its immense earning power at the time and its credit, it did not sink.

It seems almost incredible that this Bell ship survived the shock. But they did not go to complete disaster.

No one doubts that they flew distress signals, and that their present captain was hired to run the boat and keep up the speed regardless of difficulties.

Today Independent telephone interests are removed generally from the danger zone. Over 2,158,000 Independent telephones connect with the Bell and offer them no hostility.

Others are removed from either competition or duplication. And those in competition attend to their own business.

So the Bell ship has kept on speeding toward her goal. She has discredited Independent telephone securities either by banking favoritism or by threats.

Is there any use of sending the Bell ship a Marconigram, "Beware of municipal competition just ahead"?

Will her captain and officers heed the call, or will they wire back, "Thanks, tend to your own business"?

If the public honestly and truly believes in one telephone, it certainly has not approved it on the Pacific coast.

San Francisco was taken over by the Bell interests in indecent haste. People voted two to one for a municipal plant. Seattle has decided for a municipal plant.

There is no question of the possibility of municipal telephone competition. It is a condition and something that can not easily be dismissed.

I don't think many telephone men way down in their hearts care for the municipal way of handling the business. It is much more pleasant to deal with directors of private companies. Yet municipal telephone service can be a great success and no one really doubts it.

Telephone service always depends upon the immediate management. And when the municipal telephone idea gets a start in our country, be sure that the Bell ship can not strike it without sinking.

They survived the Independent collision, but they are set in the same relative financial condition today. Their margins of safety have crept very close to the danger line.

It seems to me that the voyage of the Bell cruiser Vail up the Pacific Coast last year was the costliest trip ever taken.

Why will men and managements drive right ahead on a hobby when they know there is a great chance of destruction?

The officers of the Titantic knew full well there was danger ahead. But it had no effect. And we can't call that courage, either. It is sheer bull-headedness, or stupidity. It deserves no excuse.

The Bell ship invites municipal competition and deserves all the loss. Their hobby has been one idea, one service, one company.

This cannot be. The local ownership idea must be respected. It is the economic solution of the telephone.

The public will not pay $50 for universal service when it can get it for $30 and less from a locally owned concern.

A locally owned telephone company is not subject to municipal attack as is a foreign concern. Rates can be raised locally much better.

In fact, most Independent rates can be raised by the management in a personal canvass. Not all local concerns have the nerve to try it, but it can be done.

The great difficulty that universal service will meet with is in the deprivation of cheap residence service.

There should always be a cheap service. Agitation usually comes from these quarters.

If there is to be a merger in any of the cities, it will be much better if the local company absorbs the Bell.

In nearly every place where merger is considered, the Bell company has failed, not in its duty to the stockholders, but to the public.

It is not wise to give them another chance at ruin.

If the Bell ship officers are listening to Marconigrams, let them pay no further attention to that universal hobby, but watch from the bridge for the local ownership berg.

If they do not heed, they will strike it. If they ignore it and manage to escape it, then look ahead for municipal bergs.

Municipal securities cannot be discredited, nor can municipal credit be denied.

There will be a different struggle. A Press Bureau will have no effect on bankers and business men.

Municipal telephone bonds are just as good as any municipal security. And you know how easily these issues are oversubscribed, too.

On Sunday evening the officers no doubt were felicitating themselves on the success of the Titanic's trip. The boat had not even gone as fast as she could.

It was a good boat and it was handsomely furnished. It was comfortable and its rooms were full. But it sank.

It surely offers us a good lesson. Let us examine our own reserves. Have we life boats enough to carry our stockholders and crew to safety?

Even if the Bell ship does not heed the storm signal of municipal competition, we at least can see if our house is in order.

Is your financial lamp trimmed and full of oil? Let us examine it.

The lesson of the Titanic is purely an economic one. Property must be destroyed so that we may learn how to build that which cannot be destroyed.

People must die in order that others shall live. Will the lesson be in vain?

MORAL: Even a great steamship is a local issue.

Practical Subjects—Letters and Discussions

Comments on Battery Switchboard Lighting Scheme.

In the issue of April 6, I notice a letter from Brother Martin in which he discloses the secret of a new switchboard lighting scheme for emergency use. The scheme is a good one. It is so good in fact that for the last twelve years I have universally specified a low voltage circuit on all switchboards which I have installed and have equipped the circuit with lamps adapted to the voltage of the battery in use in the exchange.

The unreliability of some electric lighting circuits is aggravating in the extreme to a telephone company and gas is not very satisfactory for emergency use for the reasons given by Mr. Martin. On several occasions that I can recall, it has been necessary to use this emergency circuit for several hours at a time, but usually the interruptions are for very brief periods but, as we all know, it is imperative that emergency lights should be ready for instant use.

Tacoma, Wash. C. H. Judson.

After reading over the letter from E. H. Martin, I believe I can go him one better in the way of lighting from batteries. Our electric lighting system is not just what one would desire in the way of service, in that the lights go out at one o'clock and we have no day service. We occasionally need lights during the day to search around dark corners, in between relays, etc., so we wired all four of our rooms, also the lighting brackets on the switchboard, to connect with 24-volt battery mains at the power board.

We use 25-watt lamps in the operating and waiting rooms, 15-watt lamps in the battery room and the room containing the main frame, relay rack, and power board, and 10-watt tubular lamps in the switchboard brackets. All lamps are 22-volt tungstens. With this arrangement we have lights any time we want them.

We charge our batteries by means of a gas engine and dynamo at a cost of less than 5 cents per kilowatt. We have an exchange of 360 subscribers (common battery), and our current costs about $1.25 per month for all except ringing current, which is done by dry batteries.

If any one can beat that for economy and satisfactory service in the way of lighting we would like to hear from them. Monroe Johnson, Manager,

Emmetsburg, Iowa. Emmetsburg Telephone Co.

Some More Automobile Data.

I have been using an automobile in the telephone field since last September, having covered about 5,500 miles in this time. One man has taken care of nearly 450 telephones or 168 miles of party line circuit, 68 miles of toll line circuit besides some work for the long distance company. Have been out on the road at least a part of the time every day except nineteen this past winter.

The average cost per mile for gasoline is slightly over one cent.

The machine was a second-hand one and cost us $350. We put on a top and made other changes to suit our business at an additional cost of $8.40. It has cost us so far as follows:

Automobile	$358.40
New parts, gasoline, oil, tires, etc	139.83
Total,	$498.23

I also use the machine to pull slack when stringing new lines. Have pulled one and one-half miles of single, or one side of circuit, at one pull, using a man to help pull the slack about a mile from the machine, this being a straight line. The time occupied in pulling and dead-ending the one and one-half miles of circuit was eight minutes. The slack was pulled to about 14-inch tension, 30 poles to mile.

G. P. Swain, Manager,

Paulding, Ohio. Paulding Home Telephone Co.

Methods of Securing New Residence Subscribers.

I am enclosing copy of a letter and form that we are using in a house-to-house canvass for residence subscribers. This letter and form is sent out along a given street and five days later the solicitor follows. Will say that we are just starting this work and not in position to say what the results are.

The letter, which is signed by R. H. Polk, general manager of the Memphis Telephone Co., is as follows:

The completion of several *sub-automatic exchanges and other recent additions to our plant and equipment* will enable us to reach practically every locality in the city and places us in position to supply many homes with telephone service hertofore impossible for us to reach. Our increased facilities will give ample lines to take care of three thousand new subscribers and we hope to add this number to our present list by January 1st, 1913.

CO-OPERATE WITH THE MEMPHIS TELEPHONE CO. IN ITS EFFORT TO DOUBLE ITS LIST OF SUBSCRIBERS DURING 1912, THUS INCREASING THE VALUE OF YOUR OWN TELEPHONE SERVICE.

Mr. J. E. Jones,

City.

We respectfully request you to give us the information asked for below, assuring you that same will be greatly appreciated and treated confidentially:

If you are a subscriber to *Memphis Telephone* service and have friends whom you would like to have use our service, then list their names below and we will take pleasure in calling on them with a view of interesting them in our service.

NAME	ADDRESS

If you are a subscriber and have near neighbors whom you would like to have use our service in their own homes instead of yours, give us their names and we will endeavor to have them subscribe for *Memphis Telephone* service at their respective homes.

NAME	ADDRESS

If you are not using *Memphis Telephone* service, but would be willing to subscribe if certain of your friends were using our service, we will deem it a favor if you will give us their names and, should we succeed in inducing them to use our service, we will then hope to add your name to our list.

NAME	ADDRESS

Cheapen the Cost of Living by Using a Memphis Telephone

Do not mislay or destroy this form nor attached stamp, as our solicitor will call for this information if not received at the office in 5 days

Post Card Designed to Stimulate Residence Business.

This letter to you constitutes part of a campaign that will carry a message to every home in Memphis from the Memphis Telephone Co., and every one co-operating with us will be benefited in a measure and all will profit by being placed in position to cheapen the cost of living by using a Memphis telephone.

Co-operate with us and reap the two-fold benefit of enhancing your own service and of being able to reach all your friends over the Memphis telephone.

We are enclosing a self-addressed and stamped form which we would be glad to have you fill out and return to us, or retain until our solicitor calls.

Call No. 400 for contract department.

The form mentioned in the letter is folded in three sections. The top fold is overlapped by the bottom section on the outside of which is the name and address of the company, The postage stamp is used to seal the folds. On the outside of the middle section is the suggestive phrase, "Use Our Long Distance Lines to the Following Points!" This is followed by a long list of the places which may be reached and the toll rate to each.

We are submitting this in the hopes that your publication will give some space occasionally to the business getting end of the Independent telephone business. The writer would be glad to hear from anyone with a suggestion for getting business in the better residence sections of a city. Would be glad to be put in touch with some one who has a good suggestion to make, that will help out a contract man.

Geo. L. Stephens, Contract Department,
Memphis, Tenn. Memphis Telephone Co.

Code Ringing System for Small Exchanges.

I enclose our code of rings which seems to be a little different from those I have seen in the columns of your paper. We find this method works well in our small exchange.

All country telephones are numbered in hundreds. The last two figures are the ring number. All the telephones on one line are numbered in the same hundred. If you wish to call some one on your line (number in the same hundred as your own number), you can find their ring by referring to the ring number. The long dashes represent the long rings and the short dashes the short rings.

Rings and Their Numbers.

02 — —	03 - - -	04 — — — —	
05 — — —	06 - - — —		
07 — — - -	08 — — — -		
09 - - - —	10 - — -	11 — — -	
12 - — —	13 — - — -	14 - - — -	
15 - - —	16 — - -	17 — - —	
18 — -	19 - —	20 — - - —	
21 - — — —	22 - -		
23 — — - - -	24 — - - -		

How the Small Exchange Code Works Out.

If you wish to call Smith on the 800 line and his ring is 2 longs, you would call for 802. Thus in every case the number of the drop is given.

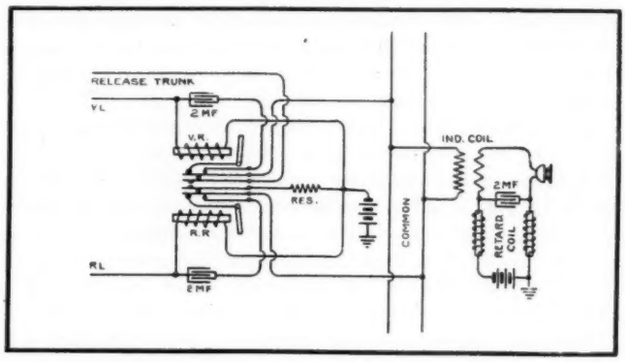
H. L. DeSpain, Manager,
Protection, Kans. The Protection Telephone Co.

Connecting Automatic Sets for Bulletin Service.

In the issue of April 6 is shown a circuit for connecting common battery 3-wire automatic switchboard trunks to a common trunk for bulletin service.

We have a similar arrangement in our switchboard at Columbus for giving out baseball scores. Your circuit does not take care of troubles due to subscribers calling on the trunk and pushing button. Pushing the button, grounds the vertical line which would make the common trunk so noisy as to render it almost useless. Also when any subscriber releases, both lines are grounded, which would ground and short the common trunk through the condensers. This would cut down the transmission to such an extent and make the trunk so noisy that it would be practically useless.

Enclosed is a rough sketch of the circuit which we use for this purpose. Please note that when either line is grounded, it is immediately disconnected from the common, only a slight click being communicated to the common trunk.



Circuit for Bulletin Service Used at Columbus.

The Columbus Citizens' Telephone Co.
Columbus, Ohio Roy Owens, Superintendent,

Telephone Men Join A. I. E. E.

The April issue of The Proceedings of the American Institute of Electrical Engineers, contains the names of the following men interested in telephone work who have been elected associate members of the Institute.

John L. Bacon, Jr., equipment man, American Telephone & Telegraph Co., Pawtucket, R. I.; Lloyd C. Eddy, engineering assistant, New York Telephone Co., New York; Everett G. Hilton, wire chief, Central District & Printing Telegraph Co., East Liverpool, Ohio; John D. Holmes, manager, Home Telephone & Telegraph Co., Pasadena, Cal.; Louis C. Metz, assistant to engineer, Bell Telephone Co., Philadelphia, Pa.; Ivan L. Milton, electrical engineer, Western Electric Co., New York, N. Y.; Paul H. Pierce, research telephone engineer, Western Electric Co., New York; William J. Shackelton, telephone engineer, Western Electric Co., New York; Harry A. Shearer, district engineer, Pacific Telephone & Telegraph Co., Portland, Ore.; Edward S. Thayer, telephone engineer, Pacific Telephone & Telegraph Co., Portland, Ore.; Carl A. Waldman, telephone engineer, Pacific Telephone & Telegraph Co., Portland, Ore.; and James C. Wright, telephone engineer, Western Electric Co., New York.

The following associates have been transferred to the grade of member:

Edward H. Everit, chief engineer, Southern New England Telephone Co., New Haven, Conn.; Nathan Hayward, chief engineer Bell Telephone Co. of Pennsylvania, Philadelphia, Pa.

Telephone Supplies for Malaysia.

In the Straits Settlements there are now 218 miles of telegraph and 7,321 miles of telephone wire reports Vice-Consul General D. Milton Figart, at Singapore. The Oriental Telephone & Electric Co. (Ltd.) operates in Singapore, and the government elsewhere. The 2,018 miles of telegraph and 3,118 miles of telephone wire in the federal Malay States are all government owned. While the government formerly purchased some supplies from the foregoing company, it is understood that the policy is now to purchase everything through the crown agents of the colonies in London.

Cases and Discussions Concerning Public Relations

This Department Has Been Established as a Regular Weekly Review of Proceedings Before Courts, Commissions or Civic Bodies—Communications Relating to This Branch of Work are Invited from All Persons Interested in Past Cases, or Those to be Heard in the Future

Texas May Create Utility Commission.

It is considered very probable that the next Texas legislature will create a state public service commission, similar to that in Wisconsin and other states. Whether the new department will be made an adjunct of the present state Railroad Commission or a separate institution is a matter that will be left entirely with the legislature. It is planned that the proposed commission shall have jurisdiction over electric street railways, interurban lines, telephone systems and all public service corporations. The creation of such a commission is favored by many of these corporation interests.

H. J. Pettingill, president of the Southwestern (Bell) Telegraph & Telephone Co., operating in that territory in discussing the subject, said:

> I believe that if each of the states should establish a corporation commission with jurisdiction over public service corporations the result would be to give the public better service and to more efficiently and economically serve it. On a recent visit to New York I met a number of officers of various Bell telephone companies, and, as naturally might be supposed, matters of general interest were discussed. It was the consensus of opinion, and it is my fixed opinion, that it is best for the public and public service corporations that the various states should create commissions with power to consider and act upon matters arising between the public service and the people.

This attitude of the Bell interests is in line with similar declarations made by them elsewhere, although not always borne out by their subsequent actions.

Maryland Commission Confers with Bell.

The Public Service Commission, of Maryland, has held a second conference with the representatives of the Chesapeake & Potomac (Bell) Telephone Co. in regard to the new rates that have been adopted by the company in Baltimore and the many complaints that have been received by the commission concerning the rates and the service in general.

Although the commissioners and the telephone officials were in conference for several hours and no conclusions were reached, it was admitted by one of the commissioners that several changes in the rates will be made, to be announced shortly by the company.

Hochschild, Kohn & Co., O'Neill & Hutzler Bros., and Joel Gutman & Co., all big department stores of Baltimore, have lodged a protest with the commission against the rates and methods of the C. & P. company.

Holding that the commission did not have sufficient data on which to base its ruling in the telephone rate case in Baltimore and declaring that dissatisfaction among telephone users there is very general, the newly formed Protective Telephone Assn. is preparing to disclose the alleged discriminations of the telephone company. As soon as possible a mammoth petition will be filled with the commission, signed by the leading business and financial men of Baltimore, asking that the case be reopened and that the ruling of the commission be set aside.

Bell Retracts in California.

The California Railroad Commission has been notified that the Pacific Telephone & Telegraph Co. had complied with a request from the commission that it correct a statement made in its announcement of the withdrawal of free service from churches, educational and charitable institutions, that the new public utilities act required such withdrawal of free service.

The commission intended that the free service should be restored to these institutions, but the company merely sent out a circular letter admitting that its action was not necessary under the new act, but stating that the service would be withdrawn anyway, in order to place its system "on a uniform basis." The commission, it is stated, does not sanction this action.

Postal Complains of Bell in Maryland.

Alleging that the Chesapeake & Potomac Telephone Co., in Baltimore, is favoring the Western Union Telegraph Co., C. E. Bagley, Baltimore superintendent of the Postal company, has filed an "informal complaint" with the Public Service Commission, of Maryland, in which he says the Bell is "wrongfully and by illegal discrimination diverting to the Western Union Telegraph Co. telegrams which are intended for the Postal Telegraph Co." Mr. Bagley cited instances in support of his claim and asked the commission to order the C. & P. company to discontinue the practice.

Bethel Files Statement Relative to Albany Situation.

F. H. Bethel, vice-president of the New York Telephone Co., has filed with the New York Public Service Commission a statement bearing upon the physical condition of the company in Albany. Statements in regard to the financial condition have been prepared but have been held back for revision and will be filed later. This information is in response to an order of the commission which asked for the data to use in connection with the subject of lower telephone rates in Albany.

Wire Companies Must Mark All Poles.

Under a proposed order of the Corporation Commission, of Oklahoma, telephone and telegraph companies must mark all poles, towers, etc., with their initials or some mark whereby ownership may plainly be shown. The companies must also arrange a series of numbers by which the location of these may be described. The order is to become effective Jan. 1, 1913. A hearing will be had May 14. The object of the order is to facilitate inspection and valuation of the companies' properties.

Camden Rate Investigation Adjourned Six Weeks.

The New Jersey Public Utilities Commission, which has been investigating the rates and service of the Delaware Atlantic (Bell) Telephone Co., in Camden, has taken a great deal of testimony and has now adjourned the matter for six weeks. Many complaints have been filed by telephone users.

Ludington to Absorb Muskegon.

Representatives of the United Home Telephone Co., of Ludington, Mich., recently appeared before the Michigan Railroad Commission with a proposition to issue stock to provide for a reorganization covering a merger of that corporation with the Citizens' Telephone Co., of Muskegon. The Ludington company has a stock issue at pres-

ent of $300,000 and asks for authority to increase that to $500,000, of which $100,000 is to be 6 per cent. preferred, the balance, $100,000, to be common stock.

The merged companies will have a total of 5,205 telephones in service with 3,686 miles of wire of which seventeen miles is underground. The plants and equipment are estimated to be worth $399,175. The commission has taken the matter under advisement.

Both companies have been under the general management of Thomas Bromley, Jr., for some time and have been practically operated as one corporation. There is expected to be no opposition on the part of the commission to their proposed actual merger.

The Men Who Do Things in the Cedar Woods.

It takes a hardy man to survive one winter, not to say anything about several seasons, in a lumber camp. Hence "lumber jacks" are strong men inured to all kinds of hardships and exposure to weather. The illustrations, from photographs furnished by the T. M. Partridge Lumber Co., show two typical "lumber jacks." The scene in the cedar woods of Northern Minnesota while very picturesque has no attraction for TELEPHONY's editors who prefer a warmer climate.

In sending in the photographs reproduced in the March 23 issue one was overlooked and sent on later. Regarding it, Mr. Patridge says:

"There was one picture that you ought to have which

In the Heart of the Timber Belt.

you failed to get and I am enclosing same herewith. This is a picture of our woods foreman, Al White. Al is the boy who keeps things moving in the woods, does all the fighting for the entire outfit and looks as much like an Indian chief as any one I can think of. If you use those pictures, please be sure to include his in the lot. This is positively the first, last and only picture that this man has ever had taken."

"Al." Woods—His First and His Latest Portrait.

It is very easy to believe all that Mr. Partridge states. "Al" undoubtedly can relate some interesting tales concerning his many years' experience in the woods and lumber camps.

Telephone Service Maintained Despite Floods.

W. L. Pfleger, general manager of the Marked Tree (Ark.) Telephone Co., writes TELEPHONY that the floods in that region have brought six feet of water into its exchange and that the situation is growing rapidly worse. Boats are constantly passing the exchange, on Main street, loaded with refugees.

Nevertheless, during this trying time, the telephone company has kept its lines working. It has a private wire to Memphis, whence are obtained every hour the government bulletins. These Mr. Pfleger has communicated to the public regularly for more than two weeks. All his operators deserted him save one, Miss Mildred Perry, who, Mr. Pfleger states, is doing double duty and has become a prominent figure in Marked Tree. His toll lineman, Paul Frederick, is doing his work in a motor boat. Managers who believe they have troubles should contemplate the Marked Tree situation for a moment.

Detroit Demands Portion of Bell Plant.

The Detroit, Mich., corporation counsel has addressed a letter to the Michigan State (Bell) Telephone Co. demanding, in the name of the city, immediate possession of the poles, conduits and equipment sold to the company about eight years ago by J. W. Martin.

The city granted Martin and the company he represented a franchise for a telephone system in Detroit, providing that, if he did not complete the undertaking, his equipment was to become the possession of the city. Martin and his company sold out to the Michigan State Telephone Co. for approximately $175,000.

The city proposes to take summary action to acquire the property and if it is not given possession at once, suit will be begun to obtain it. The equipment is chiefly of value to the city for the use of the public lighting commission and the signal service of the police department.

Legal Cases and Decisions

By A. H. McMillan

Discrimination Statute Not Applicable to Telephone.

A subscriber's telephone was out of order and afforded no service at all. The subscriber immediately notified the proper employe in the telephone exchange as per instructions in the book of rules, and frequently repeated the notice, receiving in response a promise that the repairs would be made. The telephone was finally repaired and service was then continued without interruption until the telephone was removed on account of the subscriber's alleged refusal to pay rental. It was the rule that rents should be payable monthly in advance. After the telephone was repaired, the company's collector presented a bill of $2 for the following month, which the subscriber refused to pay unless a deduction of two-thirds of the rent for the previous month should be credited on the bill for insufficient service furnished during the time the telephone was out of order. The collector declined to allow the credit and the bill was not paid. The subscriber brought suit against the telephone company for discrimination, demanding the statutory penalty of $100 per day for alleged failure to furnish telephone service during the time when the telephone was out of repair and after it was removed. The court held that the section prescribing a penalty against telephone companies for discriminating between applicants in service does not apply to negligence or inattention in failing to repair a patron's telephone. The court also held that a telephone company cannot refuse service for failure to pay for past service, and that the patron cannot refuse to pay for future service because entitled to a credit for insufficient past service. Southwestern Telegraph & Telephone Co. vs. Murphy (Ark.) 140, Southwestern, 720.

Interpretation of Interchange Contract.

The interpretation of a written contract between two telephone companies relating to an interchange of business, the connections to be made, the use of telephones and switchboards, the maintainance of lines, the placing of the wires of one, on the poles of the other, and fixing the compensation for such use has been held to be a matter to be determined by the court and embodied in his charge to the jury. The question arose in a suit brought by an employe of the Delaware Mutual Telephone Co., of Lansing, Kans., against that company and the Missouri & Kansas Telephone Co.

The contract in question released the Delaware Mutual company from loss or damages caused by wires or fixtures. Hence the case was not submitted to the jury as against the Delaware company. This the supreme court of the state held to be error and reversed the judgment. The employe was killed while stripping wires of his own company from a defective pole belonging to the other company. Aaron vs. Missouri & Kansas Telephone Co., Kans. 114 Pacific 211.

Danger of Proximity of Telephone and Light Wires.

Where a city ran high voltage circuits for lighting and power purposes along a public alley and permitted a telephone company to maintain its poles and wires in the same alley close to the power wires and directly above them, the city would be held to have known and anticipated that the telephone wires might break and fall on or near the light wires; that the telephone company's employes would be required to examine and inspect its wires to keep them in proper condition. Hence it was the city's continuing duty to its proper officers to exercise reasonable care commensurate with the dangers incident to the transmission of such current.

Under such circumstances a telephone lineman, who was injured by current escaping from the power wires to the telephone wires, sued the city of Ottawa, Kans., and a judgment given in favor of the city was reversed by the United States Court of Appeals. Finch vs. City of Ottawa, 190 Federal, 299.

Payment of Debts on Reorganization.

The Court of Appeals of Kentucky has denied a re-hearing in the case of the Maysville Telephone Co. against the First National Bank of the same place. The court in doing so held that where an intending purchaser of the assets and business of the telephone company by means of a new corporation agreed to furnish $21,000 to pay the debts of the old company, and to give the owners of the stock of the old company $29,000 of stocks and bonds of the new company, after the old company's debts were paid, the new company had no right to demand stocks and bonds representing $21,000 until it had paid the debts of the old company. The re-hearing was denied because the matters in controversy had not been properly raised by the pleading. Maysville Telephone Co. vs. First National Bank. 134 S. W. 886.

Appeals from Assessment Not Authorized.

The Chesapeake & Potomac Telephone Co., of Baltimore, filed an appeal in the Circuit Court for Alleghany County, Md., from what it alleged to be an exorbitant valuation of and unlawful assessment on its wires and cables in Alleghany county, and prayed that the increase in the valuation of the same as made by the county commissioners of that county, sitting as a board of control and review, be reviewed by that court and abated or reduced. The court dismissed this action and it was sustained by the court of appeals on the ground that the laws of 1910, c. 430, Section 17 a., do not authorize an appeal to the circuit court on the ground of an excessive valuation, that section applying only to "existing" assessments, and not to those in course of being made. The assessment in question was a new general assessment made under chapter 300. Chesapeake & Potomac Telephone Co. vs. Board of County Commissioners, 81 At. 520.

Injury to Animals on the Range.

Through the rotting of a pole which caused a wire to fall to the ground, a horse, pasturing upon the range was injured by becoming entangled with the wire. On suit being brought, the company, it was held by the court, was not liable for the injury to the horse, even though such injury was caused by its negligence in permitting the wires to fall down. An owner, said the court, who turns his animals on the range, assumes the risk of all injuries not the result of willfulness or wantonness caused by the use to which the lands on which the animals range is lawfully put. As to the liability, the court decided it would be necessary to show that the company had caused the injury willfully or wantonly, or had invited the animal's presence upon the land. Peet vs. Western Union Telegraph Co. (Mo.), 147 Southwestern, 638.

Sparks from the Troubleman's Department

A Telephone Monologue.

By James Akins Seals.

Not long ago while inspecting the telephone exchange in Belleville, Ill., I passed through the wire chief's office and overheard the wire chief say something like this: "Hello, is that you, Mike? Where are you?" "Out in the country? Doing what?" "Picking currents off the wire? Come on in. The first thing you know you'll be picking eggs off the egg plant.

Now, wouldn't that choke a fish!

Here's another one, fellows. A woman called up the Chicago office one day last week something like this: "Hello, Mr. Manager. Send a man out to fix my 'phone at once."

The manager replied: "What's the trouble?"

"Mercy me, I don't know, I examined the wires closely and picked one with a pin and looks to me like the wires are all stopped up."

Certainly, Percy, a lineman wears spurs; so does a rooster.

While verifying contracts on South State street, Chicago, one day recently, I stepped into a store run by a negro. It was a combination of a barber shop, pool room and cigar store. I said to the gray haired negro near the stove, "Is Mr. Jones in?" "No." "Will he be back soon?" "No." "Do you expect him in this afternoon?" "Can't tell." "Can I reach him by telephone?" "Lawdy me, I don't think you can."

"Well," I said, "I'll be back this afternoon about four o'clock and want to see him on important business. If he should come in tell him the telephone man was in to see him."

"Well," the darky replied, "if youse come back an' Mister Jones comes in, you won't see a nigger in dis place, and none of them will go out de way he came in."

I said, "Gee! he must be a bad guy."

"No, it taint dat, but he's daid."

Harold get away from the hot stove before you're burnt.

In the dear old town of Poplar Bluff, Mo., once I strutted into a restaurant and after finishing my mush and milk stepped up to the counter to cash my ten cent check. As I did so a man used the telephone to make a complaint like this: "Hello, chief operator. Say I can't hear anything over that telephone of mine."

She replied, "What is the nature of your case?"

"Well, I took the rubber weight off the fork and it looks to me like its ear drum is busted."

Mike get the volt meter quick, I want to take a reading of a pot head.

One afternoon I was showing a group of ladies through the exchange in St. Louis and I said: "Now, ladies, here we have a switchboard. Those openings you see are called jacks and those lights flashing are known as lamp signals. These are cords used in completing connections. This is a key shelf with keys for listening in on connections, also for collecting and refunding the coins on nickel telephones, with which you are all familiar."

One of the ladies exclaimed: "Oh, Mr. Manager, I got one of those coin 'phones this week and have to drop a nickel in it every time I use it, too, but since I've been here I have looked above this board and below it and all over it, and near these keys, and for the life of me, I can't find the hole where the nickels come out."

Yes, Maud, the McIntire is a long hole with a piece of metal wrapped about it.

Oh, yes, that reminds me. A gang of linemen were setting a line of poles near Des Moines, Ia., early one morning, when the foreman said: "Here, boys, we'll have to bury a dead man to keep them straight," and then left them to do the work.

A farmer boy, unnoticed, ran into the house and told his mother what he had heard. (A dead man, you know, is a log of wood about the size of a railroad tie with a heavy wire wrapped around it, which runs at an angle of about 45 degrees near to the top of the pole to keep it straight). Well, a few minutes later the mother of the boy came running out of the house with a shot gun in her arm and an American flag in her hand. Planting it in the road and leveling the gun at the lineman, she said: "If any of youse fellows bury a dead man in front of my house, youse will do it over my dead body."

Oh, you suffragette!

A telephone company in Missouri not long ago improved the toll service in an aristocratic district by cutting off a number of toll stations from a way circuit, thereby reducing the number of rings and annoyance to subscribers. Not long after this was done one of the dyspeptics came into the office and said: "I just got used to sleeping with all those bells ringing; now you've stopped it I can't sleep unless I hire the butler to stay up all night and beat a dish pan near my bedroom door."

What do you think about that for a loose connection?

We grieve to confess that before room could be found for the above drawing, which is reproduced from an English paper, and which was sent us by one of our readers, the original copy, giving the gentleman's remarks into the telephone, was lost. However, his plaint is too good to miss, its general tenor being as follows: "Aw, I say, me good girl, would you kindly tell me what number to call to obtain Brandford 4531? I've been calling for that number for an hour and getting everything else in the bally book."

Propose Merger in Northern New York.

The New York Public Service Commission has received an application from the Mountain Home Telephone Co., of Saranac Lake, N. Y., asking for an order authorizing the issuance by it of additional capital stock of the par value of $633,000, the making of a new general mortgage securing the maximum issue of $2,000,000 5 per cent. general mortgage bonds and the issuance of bonds thereunder to the par value of $1,004,200; also for the approval of the transfer to the Mountain Home company of local franchises held by the Adirondack Home Telephone Co., and the New York Telephone Co.

The Mountain Home company desires to purchase all the telephone property, including one local franchise, owned by the Adirondack Home company, in the counties of Franklin and St. Lawrence, of the Clinton Telephone Co., in the county of Clinton, and of the New York Telephone Co., in the counties of Clinton, Essex, Franklin and St. Lawrence, together with short extensions running into the counties of Warren and Washington.

It is not proposed at this time to make any physical consolidation of or change in the sub-licensee or connecting companies in this district but simply to transfer their business to the Mountain company which will continue to furnish them toll line service as the New York company and the three Independent companies have in the past.

The petition states that the Mountain Home company subsequent to the consolidation of the properties will be largely financed and directed locally and will be made to conform to the needs of this particular territory. While the New York company will control a large amount of the securities of the company, it is proposed to give the local interests the widest latitude in handling its business and property. Fifteen directors representative of the diversified interests in the territory will be elected and the responsibility of controlling the new organization will be placed upon their shoulders entirely.

Another Move Toward Indianapolis Merger.

The subcommittee of the committee representing Indianapolis commercial organizations seeking a plan for the unification of local telephone systems has endorsed a resolution recommending the unification of the two companies under the franchise of the Indianapolis Telephone Co.

Exceptions were taken to the report by Frank S. Fishback, who said he would present a minority report to the committee at a meeting to be held in the near future. He recommended as a solution of the telephone situation that the Board of Public Works revoke the franchise of the Indianapolis Telephone Co. on the ground that the corporation has not fulfilled the provisions of its agreement with the city and, after proper appraisement and the payment of just remuneration to the stockholders of the present company, that the stock be sold to Indianapolis business men, thus forming a co-operative company.

Receivers to Reorganize Independent Companies.

Entirely "friendly" action on the part of the security holders of the York State Telephone Co., of Elmira, N. Y., and the Bradford County Telephone Co., of Towanda, N. Y., has resulted in the appointment of M. H. Murphy, general manager, as receiver for the first named, and U. M. Fell as receiver for the latter.

Both companies are a part of the system of the American Union Telephone Co., which covers a large part of Pennsylvania and extends into adjoining states. The purpose of the receiverships is merely the reorganization of the two corporations, both of which are reported to be thoroughly solvent and expanding rapidly.

Contract of Waco, Texas, Company Passes.

The sale of a controlling interest in the Brazos Valley Telephone & Telegraph Co., of Waco, Texas, with exchanges in many central Texas towns, is reported. The buyer is said to be B. C. Hyde, of Kansas City, and associates.

The deal is believed to mean the ultimate consolidation of lines to Fort Worth, Temple, Austin, San Antonio, Tyler and many other points. It is announced that a quarter of a million dollars will be spent in improvements, and a line built at once from Waco to Dallas, continuing from Hillsboro.

The total value of the telephone properties is estimated at three-quarters of a million dollars. J. B. Earle is general manager of the company.

Michigan Company Changes Hands.

C. G. Fitzsimmons has bought the holdings of the three principal stockholders of the Reading Central Telephone Co., of Reading, Mich., thereby securing control of the company. Mr. Fitzsimmons has been connected with the company since its organization in 1903, with the exception of about a year and a half. J. F. Fitzsimmons remains president of the company and C. G. Fitzsimmons becomes vice-president and general manager.

The company now has 240 telephones installed locally. It also owns the Cambria exchange, with 167 stations, and connects with 245 more on twenty-three rural lines. It has upwards of sixty miles of toll lines. A number of improvements are projected for this summer.

Atlanta Council to Investigate Bell.

A resolution calling for an investigation by the Railroad Commission of the service and rates of the Southern Bell Telephone & Telegraph Co. has been introduced in the Atlanta, Ga., city council. It was referred to the committee on electric lights, telephones and telegraphs for a preliminary hearing.

The resolution provides that $1,000 be appropriated to pay the cost of the investigation, and directs the city attorney to draw a petition directed to the Railroad Commission which shall first be submitted for approval to the committee.

Tri-State Elects Officers.

At the annual stockholders' meeting of the Tri-State Telephone & Telegraph Co., of Minneapolis and St. Paul, the following board of directors was re-elected: E. H. Moulton, James H. Lockhart, J. M. Lockhart, H. L. Mason, Jr., and G. W. Robinson.

The board has elected the following officers to serve for the ensuing year: President, E. H. Moulton; vice-president and treasurer, G. W. Robinson; secretary, H. L. Mason, Jr.

Merger in Southern Michigan.

The Southern Michigan Telephone Co., with headquarters at Burr Oak, is reported to have purchased the Three Rivers Telephone Co., operating in St. Joseph, Cass and Kalamazoo counties, the consideration being $175,000. As a result, St. Joseph county will hereafter have but one telephone system. The Southern Michigan company was organized in 1891, and has been steadily growing. It is now capitalized at $1,000,000.

American Union Reorganization Postponed.

The date of the final reorganization of the American Union Telephone Co., and the release of the properties from the receivers' hands, has been again set forward. May 22 is now the date set for the transaction.

From Factory and Salesroom

Convention : Indiana Independent Telephone Association, Indianapolis, May 15, 16.

The Monarch's Company's New Factory.

A representative of TELEPHONY recently visited the factory of the Monarch Telephone Mfg. Co., Ft. Dodge, Iowa. He was surprised to find the plant in such good condition for manufacturing so soon after the move made by this company from Chicago.

Ft. Dodge is a thriving little city, harboring several manufacturing plants in addition to that of the Monarch company. This fact practically insures a good supply of competent and skilled workmen.

The building occupied by the Monarch company, is conveniently located and so placed, as to afford light from all sides. There is not a square foot of floor space which cannot be used for manufacturing purposes, and the light throughout the entire factory, is a noticeable feature.

The first floor of the building is devoted to the general offices, the factory office, engineering department, finished parts stockroom, shipping room, and the winding department. As individual electric motors are used in the winding department there is no shafting, belts or pulleys to be seen on this floor.

Under the first floor is a high basement which affords ample space for raw material stock, such as cabinet work, brass, steel and rubber goods. Along one side wall in the basement is a fireproof vault in which are kept the special tools used in making Monarch equipment. It is convenient to the elevator and every night the tools from the machine shop are brought down and locked up, thus preventing loss or damage from lying loose in the shop.

On the second floor is the machine shop which is devoted entirely to the manufacture of the metal parts used in telephones and switchboards.

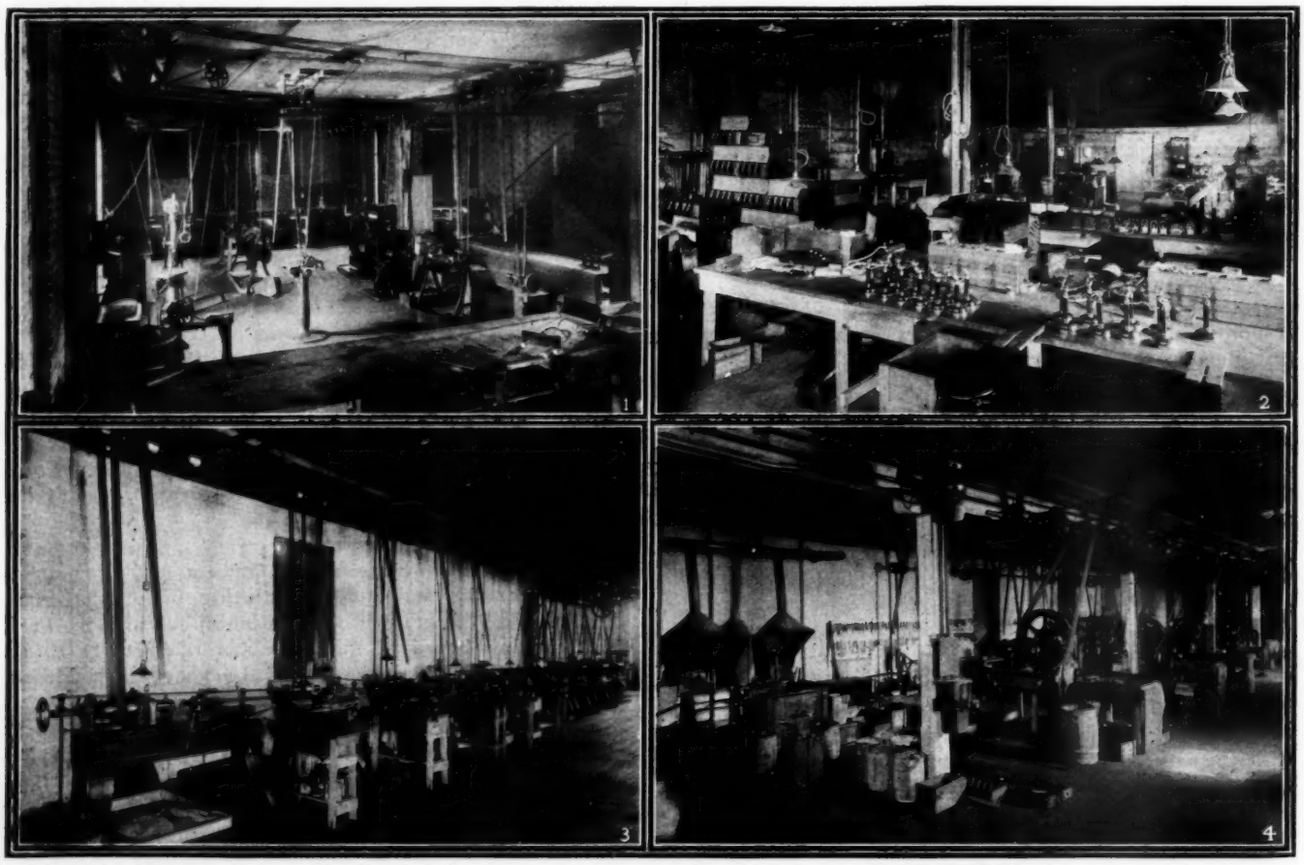
The third floor which is extremely light and airy, provides sufficient space for the telephone and switchboard assembling departments.

All through the building the ceilings are high, and the conditions are ideal for careful accurate work. Electric power is used thoughout and is supplied from the local electric company.

The large illustration gives an idea of the equipment in several departments of the factory.

View No. 1 is a scene in the tool room where the special tools are made. The workmen in this department are of the highest type as they produce the tools which are used in manufacturing all of the parts. The finest machinery is provided for the use of these tool makers. They secure their drawings from the mechanical engineering department, and the tools must be made to the dimensions given, accurate to 1/1000th of an inch. In fact their measurements must be absolutely correct, as otherwise the tools used in making one part would produce pieces which would not absolutely fit pieces made by other tools. The interchangeability of Monarch parts and pieces of apparatus has always been noticed by the users and this is due to the work of the tool room.

In No. 2 is seen the telephone assembling department.



Views of Several Departments in the New Factory of the Monarch Telephone Manufacturing Company.

The various telephone parts are brought to this department, and are mounted in the cabinets. The drilling of the woodwork is also done in this department, as is the wiring, and testing of the sets. A large freight elevator in the rear of the building supplies facilities for conveying the completed instruments to the shipping department on the first floor.

The telephones shown in the photograph are in various stages of completion. The benches are equipped with special racks for holding the instruments while the assembling and wiring are being done. Two test boards, mounted on heavy fiber backs, wired and equipped for every possible test, are located in this department, and are in charge of expert telephone testers.

Further back on this floor, are the receiver and transmitter assembling benches, each equipped with proper testing facilities.

Along one side wall extending a distance of about 100 feet, are two benches for generator assembling. The parts made in the machine shop are brought to this department in trays, and starting at one end, the assembling process continues from workman to workman, until the completed generators are ready for their final test.

Extending along the opposite wall, are two long benches for ringer assembling. The coils are brought from the winding room, and the other parts from the machine shop. The process of assembling is carried out similar to that used with the generators. When completed, the ringers are put through severe tests with current from both power and hand ringing sources. The final adjustment is made while they are being tested.

Each part as it is assembled, is thoroughly tested before being delivered to the telephone set assembling department. It is again tested after the telephone assembling is completed. By this practice of double tests, it is seldom that a defective or weak part escapes detection.

The switchboard assembling department is also located on the third floor of the building. The benches devoted to the assembling of spring jacks, drops, relays, keys etc., are placed so as to give the workmen the very best of light. This department is devoted entirely to the assembling of switchboard parts and mounting them in the cabinets. The cables are formed, laced, and placed into the switchboards and all connections soldered.

Testing facilities are provided for testing each part before it is placed in the board, and after the wiring is completed, all circuits are tested and every part is operated just as it will be called upon to operate when the switchboard is installed in a telephone exchange. After the testing is finished, the connections are tagged, although it seems almost unnecessary, owing to the simplicity of the wiring arrangement, and to the fact that each binding post is marked with a number which corresponds with a number appearing on the blue prints which are sent with the switchboards.

The third illustration in the group shows the hand and automatic screw machines. These are the machines which produce many of the parts used in telephone and switchboard work. They turn out binding posts, screws, rubber and metal bushings, studs, etc., in quantities which could not be produced except by machines especially designed for the purpose. When one of these machines is set up, a gauge with which to accurately measure the finished part is placed on it, and the men in charge continually watch the pieces to see that there is absolutely no variation. The tools used are of special construction, made by the Monarch company. The accuracy of these tools and the care exercised in making parts, are the factors which make it possible for the assemblers to put the parts together without filing or grinding.

In the last view of the group, No. 4, are seen the punch presses and the furnaces used for hardening magnets. Each press with its powerful stroke, blanks out, pierces and forms such parts as transmitter backs, receiver cups, ringer bases, switch hooks, etc. The punches and dies used in these machines are all made by the Monarch company, and on account of the care given them, there is absolutely no chance for variation in the size or form of the manufactured parts.

The Monarch's Coil Winding Department.

The furnaces are of the gas blast type. A blower provides the proper measure of air and gas, which is forced into the furnace, and is possible to heat generator magnets, ringer magnets and other parts to the required "cherry red" color. The parts after being thus heated, are taken from the furnace by means of special clamps, and hardened by being plunged into running water.

The furnaces are also used for annealing ringer cores, ringer armatures, drop cores, drop shells, etc., which must have all hardness drawn from the metal. The parts to be annealed are placed in air tight crucibles. After being heated thoroughly, the crucibles with the parts inside, are buried in lime or some other substance, which insures slow cooling.

A view of the coil winding department is shown in the small illustration. Coils play such an important part in telephone and switchboard construction, as to make the winding department of interest and importance. The machine department delivers the finished spools to the winders. The electrical engineering department has worked out specifications for each type of coil, and each winder is given instructions in regard to the size of wire to be used, and the number of turns and layers to be placed on each coil. Electrically driven motors fitted with special chucks to hold the coils, provide means of winding accurately and rapidly. Each coil is measured, and unless the resistance comes within the range allowed by the engineering department, the coil is rejected and rewound.

The motors used to wind the generator armatures, are equipped with counters which show the number of turns of wire placed on the armatures. These machines make it possible to absolutely follow specifications in making up armatures.

This department also handles such special work as forming and finishing the cords used in the wiring of Monarch telephones. In Monarch instruments, a large amount of rubber covered lamp cord is used for carrying connections, as no circuits pass through the hinges on the door and each circuit is carried just as far as possible without a break in the wire. Lamp cord is used for this purpose, and this department makes the cords.

The inspection of the new factory by TELEPHONY's representative, convinced him that Monarch apparatus, manufactured in the new factory, will be just as perfect in every detail as that which was made in Chicago. The facilities in the Ft. Dodge factory are even better than they were in Chicago, and there is no question but what the quality will be maintained and the amount of production increased. Even at this date, scarcely ninety days from the time the moving was begun, the production is almost normal.

The Monarch company is to be congratulated upon the rapidity with which the change was completed, and for the fact that the Monarch standard has been absolutely maintained. The work in every department is in charge of men who moved with the factory, and who have done their share to build up and maintain the quality of Monarch equipment.

The officers of the company are: President O. M. Oleson; vice-president, J. C. Hubacher; treasurer, Thos. Wright; secretary and general manager, W. H. Trimm. The additional directors are: E. G. Larson, president, Fort Dodge Savings Bank; E. H. Rich, cashier, First National Bank, and J. M. Plaister, manager, the Fort Dodge Tel. Co.

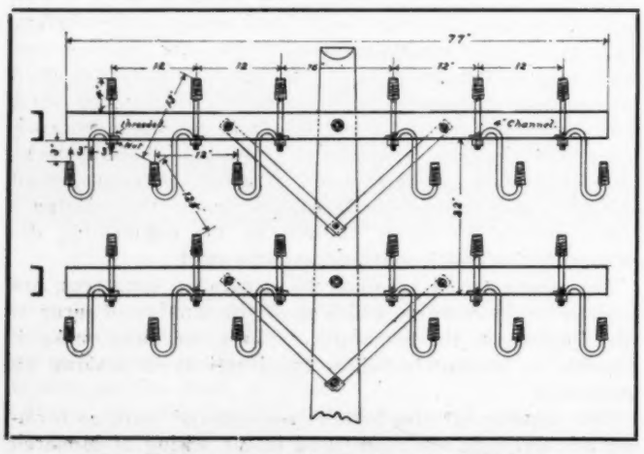
A New Departure in Cross Arms and Pins.

Metal cross arms in connection with metal pins have just been placed on the market by the St. Louis Malleable Casting Co., St. Louis. The arm and pins are intended for both high and low tension and telephone and telegraph purposes, special types being manufactured for the various uses.

The arm is made of four inch steel channel weighing five and one-fourth pounds to the foot. The arms for telephone and telegraph purposes are arranged for twelve pins; six pins are placed below the arm and six above and are in a staggered relation to one another as shown in the illustration. A spacing of twelve inches between the pins is maintained and yet the length of the arm is only 77 inches, with a 16 inch spacing between the pins at the pole. For transposition purposes, the lower pin is bent in a reversed direction from that shown in the illustration, so as to place it directly beneath the upper pin.

The arms are furnished either painted with a graphite of a very high grade, or galvanized, either by the hot or electro processes. The weight of the 77-inch steel arm is less than 34 pounds and equipped with 12 pins is 42 pounds.

The company has prepared some interesting data showing

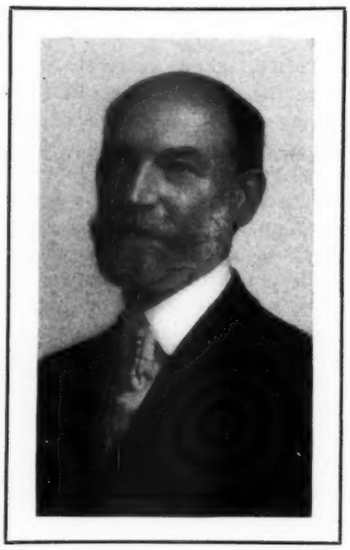


Steel Telephone Arm Equipped with Metal Pins.

the savings in first cost and maintenance by the use of these arms. Charles G. Ette, secretary of the company, is a practical foundryman of forty years experience and during the past few years has investigated and studied the possibilities of constructing metal cross arms and pins which would be the superior of anything now used for the purpose. He believes that he has successfully solved the problem and will be pleased to receive inquiries in regard to the matter. All the metal pins and cross arms which the company manufacture are covered by patents.

Gilbert B. Shaw Dead.

Gilbert B. Shaw, lumberman and banker and a leading interest in the Naugle Pole & Tie Co., of Chicago, died April 13, at his home, 3423 Michigan avenue, in that city. He was 75 years old. Mr. Shaw was born at Ontario, N. Y., in 1837, educated in the East and came to Moline, Ill., with his parents. At the close of the civil war he started in life as a logger. A few years later he went to Chicago as a bookkeeper for a lumber firm.



Gilbert B. Shaw.

In this bookkeeping position he gained his ideas of the lumber trade, which were later incorporated into a giant business controlling the largest string of lumber yards known until recent years, when combines began to flourish. In 1887 he forsook the lumber trade for the banking field. He was the organizer of the American Trust & Savings Bank and its president until the consolidation with the Continental National Bank. He was active in the management of the Naugle Pole & Tie Co. until recently, when his health began failing. He was a director in the Congress Hotel Co. and the Guarantee Electric Co. He was a member of the Union League and Midlothian Country clubs.

Mr. Shaw is survived by four daughters, Mrs.. Charles E. Maxwell, Mrs. Wilbur L. LaFean, Mrs. Robert W. Tansill and Doris Shaw.

New Name for Johnston Electric Co., Omaha.

Announcement has been made of the reorganization and enlargement of the Johnston Electric Co., Omaha, Neb. The name of the company has been changed to Mid-West Electric Co. Geo. W. Johnston, the founder of the former company and for 25 years engaged in the electrical supply business in Omaha, is president of the reorganized company.

Geo. A. Seabury, who is secretary and general manager, has been for several years connected with the General Electric Co. as manager of the Kansas City branch.

H. J. Coleman will act as illuminating engineer. Ned McCue, who is well known to telephone men in Nebraska, will be one of the salesmen.

It is said that the new concern will be one of the largest dealers in electrical supplies west of Chicago.

The Delta Electric Company.

Several weeks ago announcement was made that the recently organized Delta Electric Co., Chicago, had purchased the stock of materials, tools, etc., for manufacturing the lockout party line telephone systems, from the Baird Electric Co.

This new company is composed of Arthur E. Case, formerly chief engineer; John H. Brownrigg, formerly super-

intendent, and Harry Henderson, formerly chief model maker of the Baird Electric Co. These men are thoroughly familiar with measured service telephone equipment and lockout systems and intend to place the new company in a foremost position in this field.

Mr. Case has had considerable experience in the practical side of telephone work. After graduating from the Bliss Electrical School, Washington, D. C., he entered the employ of the United Telephone Co., Marion, Ind., serving as switchboard man and wire chief in several of the exchanges. This was not Mr. Case's first experience in telephone work as for a number of years he had worked around telephone exchanges at odd times while attending school.

After two and a half years service with the United company, he joined the Baird Electric Co., Chicago, as installer and salesman, later becoming chief engineer. During his association with the Baird company he developed the Baird party line system to a high state of efficiency. He also brought out the Baird automatic master selector, which automatically selects and rings any one or more telephones on a line of twenty or less, all the other telephones being locked out. Mr. Case also did a great deal of work in developing and perfecting prepayment and metering equipment which the Delta Electric Co. will manufacture.

Mr. Brownrigg who will have charge of the shop of the new company, is familiar with all forms of shop work. He served six years apprenticeship in a machine shop, beginning at the age of 14 years.

He was die and tool maker for several operating and manufacturing telephone companies. This was the stepping stone to positions as foreman and later as superintendent with some of the well known telephone manufacturers.

Five years ago he became foreman and superintendent for the Baird Mfg. Co., which position he held up to the time of the organization of the Delta Electric Co.

From this brief sketch of Mr. Brownrigg, it can be seen that he is thoroughly familiar with the manufacturing of

Arthur E. Case.

telephone equipment and under his supervision the output of the new concern should be of high standard.

Mr. Henderson is a native of Norway, coming to this country in 1890. He entered the telephone manufacturing field in 1892, obtaining employment with the Western Electric Co. He was with this company for 5 years, being engaged in the manufacturing and installing of electrical and telephone equipment. Since 1897 he has been devoting his time to the making of models for telephone manufacturers. Seven years ago the Baird company secured Mr. Henderson's services as chief model maker, which position he held up to the time of the organization of the new company.

The Delta Electric Co. is manufacturing and has been shipping lockout party line apparatus for several weeks. Prepayment and electrical pay stations and telephone meters will also be manufactured. It is the originator of a line of measured service equipment which is being investigated with deep interest by prominent operating companies.

New Catalog of Expansion Bolts and Specialties.

The Diamond Expansion Bolt Co., New York, has issued an attractive new catalog, illustrating and describing its line of expansion bolts and telephone construction specialties. The make-up of the new book is unusually convenient, the illustrations, descriptions, detailed specifications, prices, etc., of each article being grouped together and well displayed. The Diamond company has perfected its line of expansion bolts until it now has a most complete line. In addition to bolts, this firm also manufactures drill points and holders, insulator brackets, toggle bolts, "Long Saut" cable clamps, bridle rings, conduit rods, ground clamps, guy clamps and various other telephone specialties, all of which are attractively presented in the new catalog. The Diamond Expansion Bolt Co. wants every telephone company to have a copy of the new book.

Protecting Pay Station Customers.

One of the largest pay station customers of the Baird Equipment Co., Chicago, lately submitted the patent question to Judge Louis M. Hosea, of Cincinnati, who after a very thorough investigation rendered the following opinion: "I am of the opinion that the apparatus as illustrated in the sample submitted is not within the scope of the suit of Gray versus Baird, but is entirely free therefrom."

As a result of this opinion, the customer in question placed orders with the Baird company for 700 additional pay stations, to show that he was entirely satisfied with the patent situation.

The Gray patent decision related to signal transmission by "resonant connection" between the signal box and talking transmitter, whereas the latest type of Baird pay station is designed to transmit signals by a microphone or magneto gong, independent of the talking transmitter, which is shunted during the signaling period. As a result, it is said that the signals received by the operator are remarkably clear and unmistakable, with the receiver either on or off the switch hook.

Paragraphs.

THE DART MANUFACTURING CO., Waterloo, Iowa, has announced an increase in the price of "Dart" cars, effective May 1. The company states that this increase in price is simply to cover the actual increase in the cost of production of the improvements which have been made in the machine.

JOHN W. COFFEY, originator of the Coffee System of telephone accounting, will install his system next week for the Interstate Telephone Co., of Dyersville, Iowa. This company operates fourteen exchanges. Mr. Coffey reports a growing demand for his plan, and sees an exceptionally prosperous year ahead of Independent telephony.

THE ANDERSON ELECTRIC MFG. CO., Chicago, will move May 1, to the Sharples Building, corner Jefferson and Washington streets, from its present location, 328 North May street. This company manufactures the well-known Anderson lockout system, and its new facilities will

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

PERSONAL.

C. D. BOYD, who has been the Michigan representative of the Kellogg Switchboard & Supply Co., Chicago, for the past two or three years, leaves that corporation on May 1, to take a position with the sales force of the Chicago branch of the Anderson Electric Car Co. of Detroit. C. D., whose full name is Carl Donald, was born in 1882, of Scotch and German parentage and, therefore, has by birth some of the qualifications which make a successful salesman. He drifted into the telephone business in the fall of 1897 as a night operator and troubleman for the Citizens Telephone Co., of Cambridge City, Ind., the following year being in the construction department. In 1899 he accepted a position in the signal service department, telephone and telegraph at Pittsburgh for the Pennsylvania Railroad Co. He remained with the railroad until 1901, when he identified himself with the Eureka Electric Co., of Chicago, in the manufacturing and sales department. In the fall of 1902 he accepted a position with the North Electric Co., of Cleveland, and was with it until June 1, 1910, when he accepted a position with the Kellogg Switchboad & Supply Co. as Michigan representative, which position he has just resigned.

C. D. Boyd.

During his fifteen years of activity in the telephone business, Mr. Boyd has traveled the states of Indiana, Michigan, Ohio, Illinois, Missouri, Kentucky, Tennesee, West Virginia, Virginia, Pennsylvania Minnesota, South Dakota, and Iowa. Needless to say, a host of friends in all these states will be sorry to have him leave the business, but at the same time will wish him success in the new undertaking.

One of the great secrets of Mr. Boyd's success is that he always endeavores to protect and safeguard the companies to whom he sold. This made him, in the long run, many friends. Another secret is that he protects the interests of the local Independent company in his territory, regardless of whether he is selling it goods or not, and this has made him many friends and created new business for his company. He is a salesman of exceptional ability and his experience will qualify him for his new position with the Anderson Electric Car Co.

LESTER F. ELLIS has been appointed manager of the Aroostook Telephone Co., at Houlton, Maine.

J. C. DANIELSON, who for the past four years has been president of the Lamoni (Iowa) Telephone Co., has resigned. He will be succeeded by Chas. France.

EDWARD L. CLAYTON, for fifteen year manager at Milton, Ill., for the Pike County Telephone Co., has accepted a position as salesman for the Parks Music Co., of Hannibal, Mo.

W. C. ANDERSON, manager for the Cumberland Telephone & Telegraph Co., at Murfreesboro, Tenn., has been promoted to the management of the Hopkinsville, Ky., exchange. White Yearwood, succeeds him.

SAMUEL HILL, president of the Home Telephone & Telegraph Co., of Portland, Ore., is a man of many activities outside the telephone business. Among other things, Mr. Hill recently delivered an address on "Home Building," under the auspices of a local improvement club. This was illustrated with stereopticon pictures of beautiful scenery at home and abroad. He recently offered cash prizes aggregating $100 to the students of the public schools who wrote the best essays of 1,000 words on this subject: "The Telephone Situation in Portland. Will Public Ownership be Better than Competitive Service?" The individual prizes range from $5 to $20. The school board sanctioned the contest and will permit the contestants to inspect the Home company's plant in order to better study telephone conditions.

NEW COMPANIES.

BIRMINGHAM, ALA.—Among other privileges granted in the petition for incorporation filed by the Tidewater Power Co., the right to build a telegraph and telephone line between Birmingham, Bessemer, Brookwood, Tuscaloosa, Holt, Gadsden, Atalla, Alabama City, Asheville and Springville is mentioned. The company has a capital stock of $2,000. J. M. Dewberry is president and R. D. Johnston, Jr., secretary.

LYERLY, GA.—R. E. Echols, W. D. Gilkerson and others have applied for a charter granting the right to build a farmers' line.

MUSCATINE, IOWA.—The Lucas Grove Road Telephone Co., just incorporated with a capital stock of $2,000, has lines in Lake township, Muscatine county, maintaining headquarters here. The incorporation dates back to January 12, 1912. The officers are: L. G. Coder, president; John Stuart, vice-president; A. J. La Tourette, secretary; and C. S. Harper, treasurer.

ROCK RAPIDS, IOWA.—The Farmers' Mutual Telephone Co has been formed here.

ASHLAND, KY.—The Ashland Telephone Co., capitalized at $125,000, has been incorporated by W. B. Seaton, Chas. F. Weaver, Chas. Russell, John Russell and Harold Means.

VESTABURG (R. F. D. 1), MICH.—The Ferris Independent Telephone Co. has been incorporated here, to operate at Ferris, Montcalm county. It is capitalized at $500. The incorporators are Otis Eggleston, George Douglas, C. L. Dyer and others.

FORSYTHE, MONT.—The Rosebud Mutual Telephone Co. has been organized here, with a capital stock of $5,000. The incorporators and directors are John Davidson, Hugh Lynch, Henry W. Bailey, all of Lee, Mont., and Alexander McIntosh and Mert Francis, of Forsyth.

FULP, N. C.—The Town Folk Telephone Co., with $5,000 capital, has been incorporated by Chas. Bodemhiemer, E. Fulp, Barker Bros., and J. V. Marshall.

NAPOLEON, OHIO.—The Napoleon Telephone Co. has been incorporated by W. L. Parmenter and others. The capital stock is $50,000.

BEXAR, TENN.—The Bexar Telephone Co. has been formed here. The officers are: Dr. J. A. Bradford, president; J. W. Webb, secretary.

MAY, OKLA.—The May Telephone Co. has been organized, with a capital stock of $2,500. Incorporators are J. E. Feather, Joseph Phillips and T. M. Fleming, all of May.

PIKETOWN, PA.—The Blue Mountain Telephone Co. has been formed, with headquarters here, the capital being fixed at $5,000. The incorporators are George W. Reed, Samuel C. Sweigart, Isaac Straw and others.

ROSEFIELD, S. D.—The Rosefield Telephone Co. has been incorporated by Ben C. Graber, Jacob E. Graber and J. P. Graber, all of Marion. Capital is fixed at $15,000.

GAYVILLE, S. D.—The Gayville Telephone Co., Rural Line No. 2, has been incorporated, with a capital stock of $3,000, by Christ Peterson, C. Councilman, Ed. Peterson and others.

JOSEPH (Sevier County), UTAH.—The Joseph Telephone Co. has been incorporated, capitalized at $4,000. The officers and directors are: President, Jesse Willes; vice-president, James A. Ross; secretary and treasurer, John A. Parker; J. W. Parker, G. L. Ross and Wm. Utley.

MORONI, UTAH.—The Moroni Telephone Co. has been incorporated here, with a capital of $3,000. The officers are: Edward Johnston, president; Jabez Faux, Jr., vice-president; E. D. Anderson, secretary; Andrew Anderson, treasurer.

GASSAWAY, W. VA.—The Gassaway Telephone Co., just incorporated, will build in Braxton, Gilmer and Calhoun counties. The capital is $10,000. The incorporators are David Frame and C. W. Marple, of Gassaway; May F. Frame, of Sutton; J. J. Stalnaker, of Progress; and C. N. Snodgrass, of Rosedale.

CONSTRUCTION.

CANTON, ILL.—The Canton Home Telephone Co. plans to erect an exchange building here this summer.

FLORENCE, MINN.—The Florence Telephone Co. will build at least one new line this summer and possibly more.

JOHNSTOWN, PA.—The Johnstown Telephone Co. is preparing to build an exchange at Beaverdale.

LADYSMITH, WIS.—The Chippewa Valley Telephone Co. is going to practically rebuild its system here, at an expense of approximately $8,000. Cable will replace open wire.

WAUSAU, WIS.—The Wausau Telephone Co. is about to establish exchanges at Schofield and Rothschild.

FINANCIAL.

DENVER, COLO.—The Mountain States Telephone & Telegraph Co. has paid the regular quarterly dividend of 1½ per cent. on its preferred stock.

CINCINNATI, OHIO.—The Cincinnati & Suburban Bell Telephone Co. declared and paid recently an extra dividend of 2 per pent., in addition to the regular quarterly disbursement of 2 per cent.

BELLEVUE, OHIO.—The Local Telephone Co. paid, April 1, its regular quarterly dividend of 1½ per cent.

COLLEGEPORT, TEXAS.—The Collegeport Telephone Co. has filed proof of final payment of its capital stock.

ELECTIONS.

SMITHSHIRE, ILL.—The Smithshire Telephone Co. has elected the following officers for the coming year: President, C. J. Anderson; secretary-treasurer, Scott Staley; manager, B. S. Davison.

Out of the Mail Bag

Notwithstanding the tradition that business conditions are poor in a presidential election year, TELEPHONY's recent correspondence indicates that telephone companies throughout the country are enjoying good times in 1912. Of course, as always, there are some bad spots, but, generally speaking, the operating companies are making good headway, and that means business for the manufacturers and the allied branches of the industry. The provincial government of Manitoba, Canada, sent an order for twenty-two subscriptions to TELEPHONY this month, so it looks as though our Canadian friends also are on the alert and determined to keep posted on developments in the telephone field.

H. E. Wirt, treasurer of the Metallic Lightning Arrester Co., of Winona, Minn., in a letter renewing his subscription to TELEPHONY, says: "Your paper is good and should be in the hands of every telephone man. I am kept as near busy as any telephone man re-installing telephones that we took out after we raised our rates, filling orders for Metallic Lightning Arresters and assisting Miss Linden ship out daily balance sheets, but I find the time to read TELEPHONY from cover to cover."

H. H. Knipe, president of the Southeastern Illinois Long Distance Telephone & Telegraph Co., of Robinson, Ill., in sending in his renewal for 1912, says: "We thoroughly appreciate the worth of TELEPHONY to the Independent telephone interests."

One Man Who Appreciates His Telephony.

The accompanying illustration is from a photograph sent us by one of our readers who evidently appreciates the wealth of good things and valuable data appearing in TELEPHONY every week and proposes to keep them at his finger tips for immediate reference. The picture is practically self-explanatory. Unbound copies of the paper are carefully kept on file until the volume is completed, when they are neatly and substantially bound. Week by week items of all kinds are classified on cards in a modern card index drawer.

"I do not want to miss any numbers of TELEPHONY, as it is too valuable," writes F. A. Kearns, local manager of the Fillmore County Telephone Co., of Fairmont, Neb. "I think every man in the telephone business should be a subscriber to TELEPHONY."

R. L. Bailey, of Geneva, O., writes: "Since my trial subscription, I cannot understand how I ever managed to get along without TELEPHONY. My one regret is that I did not appreciate it years ago." Mr. Bailey is wire chief for the People's Telephone Co. and enclosed his renewal for 1912.

"Can't keep house without TELEPHONY," is the terse comment which accompanies the renewal check of Sol Nighsonger, of Sullivan, Ill.

D. G. Edwards, general manager of the Hopkinsville (Ky.) Home Telephone Co., in sending in his remittance, writes: "I sent you check the other day for the renewal of our subscription, but as your journal is so interesting to employes I have decided to take two subscriptions."

Other managers should follow Mr. Edwards' example. It is a good investment to enable employes to keep posted on telephone matters.

"TELEPHONY is worth a great deal more than six cents a week," writes J. S. Bellamy, president of the Knoxville (Ia.) Electric Co., which operates electric light and power and the local telephone plant, in a letter enclosing his check renewing his subscription.

E. D. Selmser, of Houston, Texas, writes: "As an old subscriber I want to thank you for the way you keep up your valuable journal. We can hardly wait from week to week, so keep up the good work." Mr. Selmser writes enthusiastically of the progress the automatic service is making in Houston. "They are putting in telephones very rapidly here, and everyone is more than pleased with the fine service given. It is far ahead of the Bell."

"I think TELEPHONY the best Independent telephone medium it has been my pleasure to read," writes E. E. Buck, of Raymondville, Mo.

H. B. Fallgatter, of Oakley, Kan., writes an interesting letter of conditions in that section of the Sunflower State, in which he says: "TELEPHONY is worth every cent of the subscription price. I read some objections regarding the division of space in the paper. I have been night operator, lineman, foreman, superintendent, manager, switchboard installer, engineer, power man, wire chief and owner in many different states and I consider your paper perfectly balanced and the finest Sunday reading I can secure, except you devote too much space to the railroad department. Why? Because I was never employed in railroad work. Maybe others' objections arise from the same cause."

The Kansas man is right. The reader wants to see plenty of information about what interests him, and is inclined to consider all else of little importance. Trying to keep the paper well balanced is what makes most editors gray-haired before their time.

"Your publication is just the thing for a person who is interested in telephones," writes Lewis T. White, of Peabody, Kan.

"We enjoy TELEPHONY very much," writes Wentworth V. Holmes, manager of the Joy (Ill.) Telephone Exchange.

"Keep the paper coming," says H. I. Robertson, of the Consolidated Telephone Co., of Wilkesbarre, Pa. "Life does not seem complete without it."

Remarks By Mr. Oldsubscriber.

By R. D. Mock.

"Good morning," said Mr. Oldsubscriber, oozing into the room. "Does the gentleman who dispenses the cigars reside here?"

"He does not," replied the manager, locking the drawer of his desk where he keeps the cigars. "The gentleman who resides here dispenses with the cigars."

Mr. Oldsubscriber looked on rather hungrily as the manager put the key in his pocket. "I do declare," he said reproachfully, "if you haven't taken to keeping your cigars under lock and key!"

"Yes," replied the manager, "I had to come to it. You see there are a lot of people wandering around the country who would like those cigars, so I just lock them up to curb their desire for them."

"I see," returned Mr. Oldsubscriber. "It is your notion that if anybody wants anything of yours, you are going to make it just as hard for him to get it as possible."

"That's the idea," agreed the manager. "You see if anybody were to come into this room with the avowed intention of getting those cigars, he would have to carry

"Takes a Contract Away from You and Signs It."

my desk away with him, and he might get discouraged before he got very far."

"Well," said Mr. Oldsubscriber resignedly, "perhaps it is a good plan to make it hard for people to get at your valuables. At any rate, I see that you are consistent, and consistency thou art a jewel."

"How do you mean that I am consistent?" asked the manager.

"Why you lock up not only your cigars but all your valuables as well. What is the most valuable thing you possess?"

"My watch," said the manager.

"I'll give you another guess."

"My tie pin."

"No, your most valuable possession is the ability to render telephone service. Value is always based on scarcity. Now there are lots of men in this county with watches and tie pins, too, but there are mighty few men who can place their fellows in close communication with each other. For that reason, your most valuable possession is your ability to render telephone service. And following your policy with the cigars you have locked it up.

"Now there is my cousin, Salindy Spratt. She lives right across the street from me and I guess she runs in seventeen times a day to use our telephone. One day I says to her, 'Salindy,' says I, 'why don't you put in a 'phone?' 'Well,' she says, 'we sure need it bad enough, but seems like we just can't make up our minds. Some days we'll be all decided to get a 'phone, and the next day something comes up and we put it off a little while longer. I suppose we'll have to get one sometime, though.'

"Now there's just one case. Salindy Spratt belongs to that great class of people who can't make up their minds without help. She needs a telephone, she wants one, and if you would unbend your dignity sufficiently to say telephone to her just once, she would have a telephone. But she knows that in order to get a telephone she must come down here and pry one out of your safe deposit vault, and then back you up against the wall while she takes a contract away from you and signs it. And I guess it's so much bother that she would rather keep on borrowing her telephone service in the same old way. You may say that you'll get her finally, and perhaps you will, but a little effort on your part will get her a whole lot sooner, and her money ought to be as good now as six months later.

"I sometimes get to wondering what the result would be if telephone companies were run like insurance companies. I don't believe there is a man in town who doesn't carry all the insurance he can afford. The insurance companies have a good thing, and they want people to know it. The telephone companies have a good thing, but they seem to relish the idea of keeping the fact artfully concealed. A man doesn't have to buy insurance—they'll sell it to him. But he has to sell himself a telephone, and frequently he has so many other things to do that he forgets to buy it. I don't pretend to be any wizard of finance—I am only an expert on the political situation—but it does seem to me that the way to sell anything is to make it easy for people to buy. The old theory that Emerson sprung about if a man made anything better than his neighbors they would make a beaten path through the forest in order to get at him, is so near exploded that it is a shame to mention it. And Salindy Spratt is one denial to the theory.

"Well, I must hurry down to my office in front of the store. Sam Bly and I are going to decide this afternoon whether the people or the corporations should elect the senators. Going to be a mighty interesting discussion. Join us?"

"No," replied the manager, "I am going to be busy all afternoon. Got to start out now."

"Where are you going?" asked Mr. Oldsubscriber.

"Down to see Salindy Spratt."

A Combination Land and Water Line.

Connection from St. Petersburg, Fla., by telephone with Pass-a-Grille, a popular island resort, is promised by the West Coast Telephone Co., within a space of three months.

To make this connection it is necessary to run a line of poles across Boca Ceiga Bay from the mainland to Deadmans Key where the water is shallow, not more than five feet in the deepest points. From this key to Long Key, on which Pass-a-Grille is situated, the water in some places is forty feet deep and it will be necessary to lay a submarine cable for a distance of 250 yards.

From the northern extremity of the key to Pass-a-Grille on the other end the poles will be set in the sand.

To Interchange Service in Ohio Town.

The West Milton (Ohio) Home Telephone Co. has reached an exchange agreement with the Bell for toll messages. Connections will be made and a schedule of rates filed with the Public Service Commission at once.

Bell Sells to Independent in Kenton, Ohio.

The Central Union Bell properties in Kenton, Ohio, have been taken over by the Kenton Telephone Co.